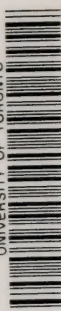


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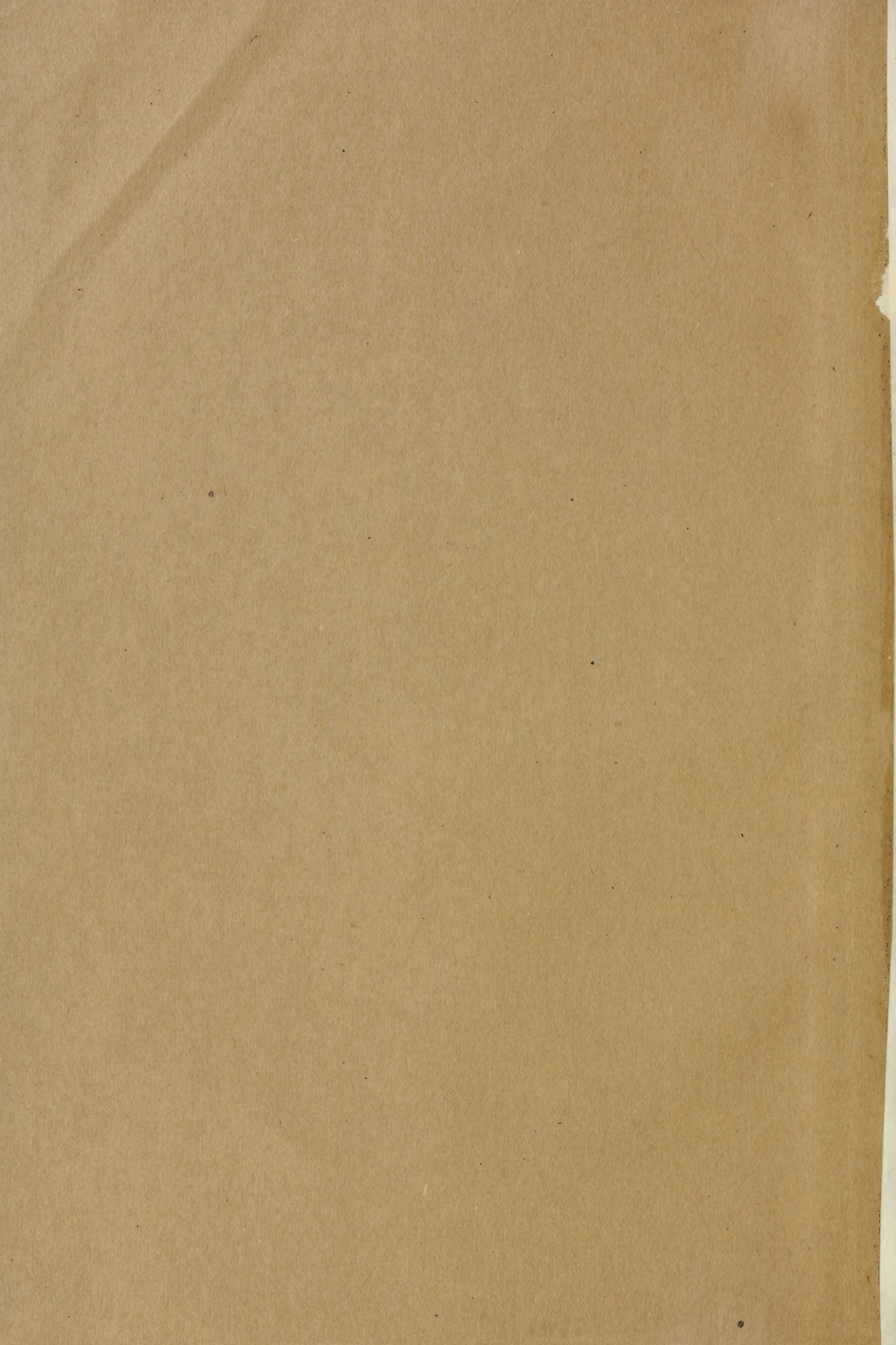
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AN EXPERIMENTAL INVESTIGATION
OF THE PROCESS OF
CHOOSING



BY
RAYMOND H. WHEELER
UNIVERSITY OF OREGON

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An Experimental Investigation of the Process of Choosing

By
RAYMOND H. WHEELER
University of Oregon

I. INTRODUCTION

The experimental investigation here reported aims to present a detailed description and analysis of the mental processes involved in the act of choosing, together with an interpretation of the functioning of these mental processes.

In 1910 Michotte and Prum (6) made an experimental analysis of the act of choosing. Their materials consisted of groups of numbers which were written upon cards in such fashion that certain simple arithmetical operations (adding, subtracting, multiplying, dividing), were possible and convenient; and their method consisted of presenting one of these cards in a tachistoscope, with the instructions that the observer should choose for a serious motive either to add or subtract, to multiply or divide the numbers. Here it was found that one of the determining factors of the volitional consciousness consisted of a "feeling of mental activity" (*conscience de l'action*) which is unanalyzable and which is intimately associated with a consciousness of the self. The authors expressly state that this feeling of activity should be differentiated sharply from an awareness of muscular strain.

Contemporary with these latter experiments, Barrett (3) investigated motives and motivation. He first established strong associations between eight unpleasantly tasting liquids and eight corresponding nonsense names; then he presented these names to his observers in as many combinations of pairs as possible. On a shelf between the observer and the experimental apparatus rested the two glasses of liquids corresponding to the names in the tachistoscope. The observer was asked to choose one of the names

This study was made in the Psychological Laboratory of Clark University. The writer expresses his sincere thanks to the observers who made this investigation possible; and he wishes to acknowledge a special debt to the late Professor John W. Baird under whose supervision the experimentation was conducted.

and to drink the corresponding liquid. His analysis of the act of choosing failed, in essence, to improve upon the work of Michotte and Prum.

II. METHOD, APPARATUS AND OBSERVERS

The observers who took part in this investigation were all trained introspectors and members of the department of experimental psychology in Clark University. They included Professor John W. Baird, Assistant Professor Samuel W. Fernberger, Drs. S. C. Fisher, Ivy G. Campbell, Florence Mateer, George S. Snoddy, Harold R. Crosland, F. J. O'Brien and the writer. The investigation extended over the two years from 1913 to 1915. The acts of choosing, of which there were more than one thousand in all, are divided into four series.

In the first series all observers but *F* participated. Our materials here consisted of pictures of noted landscapes or buildings, reproductions of famous paintings and of sculpture. These pictures, some of which were of postcard size and some of which were Perry picture size, were suspended before a uniform background, in pairs; and after a ready signal, a pair was exposed to the observer, with the following instructions: "I am going to present two pictures to you; you are to select one of them to hang in your room. If neither appeals to you, you may reject both." The latter part of the instructions was introduced to avoid forcing a choice in such cases where no genuine basis of choosing was present.

In the third series all of our observers took part.* The materials consisted of vocal and instrumental selections from the Victrola. The titles of two selections were printed upon small cards and exposed in a specially constructed tachistoscope, with the following instructions: "I am going to present two cards bearing the titles of two selections of music; at the top of each card you will find the title of the selection and the name of the composer; at the bottom you will find the name of the instrument, performer or vocalist. Choose which of these selections I shall play to you, but if you care for neither you may reject both." The chosen selection was subsequently played to the observer.

An attempt was made to reproduce in the laboratory the same conditions of genuine choosing as might occur from time to time in everyday life. If any act of choosing failed to be genuine or if it

*The second series of experiments were performed on a limited number of subjects, using smoking materials for alternatives. The results were similar to the findings in series one and three and are, therefore, not included in this paper.

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were superficial, uninteresting, or vitiated by any unusual circumstances, introspective data therefrom was disregarded. The observer dictated his introspection to the experimenter or to a trained stenographer immediately after he had made his choice.

III. RESULTS

A. *Introduction.* The period which intervened between the hearing of the instructions and the perceiving of the alternatives will be called the "fore-period"; the main-period began with the perceiving of the alternatives and continued to the end of the act of choosing. Inasmuch as the results of the first three series of experiments are similar, functionally, and vary structurally only in insignificant details, we include the results of all three series in a single description.

B. *The Fore-period.* 1. Introspective data. The following introspections of the mental content involved in the fore-period are here included for the purpose of indicating to the reader the data from which the results have been taken. The fore-period was the same for all choices with the exception of those in series four, which latter are mentioned later.

(Parentheses denote the reagent's own interpretation of his experiences; brackets indicate explanations or interpretations added by the writer.)

1. Series 3. *Observer D.* In the fore-period I had vocal-motor-auditory images of repeating the instructions, tensions about the eyes as I fixed my gaze upon the screen, visual images of two white cards localized behind the shutter of the aperture, together with kinaesthetic imagery of moving my eyes from one white card to the other. My attention was then claimed by an awareness of a general bodily adjustment to the experimental situation—I leaned forward, there were muscular tensions about the face, shoulder and chest; I breathed more slowly. All of this was associated with a high degree of concentration of attention. [Note that the reagent has here experienced in anticipatory fashion the movements and adjustments which later increase in complexity and definiteness.]

2. Series 3. *Observer B.* I repeated the instructions in syncopated vocal-motor-auditory imagery; then I was aware of kinaesthetic sensations from turning my head and neck toward the opening of the screen, together with strains of fixating the aperture. While my head was turning, I had visual images of the phonograph on the table and of white cards behind the screen, followed immediately by increasing tensions about the face, shoulders and chest, especially in the region of the eyes. . . .

3. Series 3. *Observer A.* During the hearing of the instructions I tended to repeat each sentence in vocal-motor-auditory imagery. When the experimenter announced that he was going to give me primitive music I had the vocal-motor-auditory: "Oh! Primitive music; (I) like primitive music; choose (the) one (I) prefer; (the) don't want either (alternative) won't happen." This was followed by the vocal-motor-auditory: "Probably don't know either; good, (I am) interested in primitive music; hurry up and present them to me." During this time I was conscious of rather intensive strains about the brows, shoulders and chest; and as the time approached for the exposure of the stimuli (alternatives) these strains increased in their intensity and at the same time became widespread. . . . [Here the reagent is assuming a favorable

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attitude toward certain anticipated alternatives and the motor preparedness to proceed in the act of choosing is greater than is required for mere fixation of attention. The reagent is unconsciously tending to choose in an anticipatory fashion and expresses this tendency in his eagerness for the exposure of the alternatives, in the widespread muscular tenseness and in his desire for the early exposure of the alternatives.]

4. Series 3. *Observer C.* While the experimenter was giving the instructions I had visual images, together with accompanying eye-movements of seeing him place a record upon the machine; the word "choose" came to me in vocal-motor-auditory imagery, followed by more verbal imagery of saying to the experimenter: "This is the one I will hear (on the phonograph)"; then I had kinaesthetic imagery and incipient arm-movements of pointing to a record which the experimenter seemed to be holding in his hand; I then had visual images of two white cards, one above the other, located behind the shutter. Then I had faint auditory imagery of a certain orchestral selection in which I was merely conscious of the qualities and pitches of the tones which came to me in pleasant intervals. As the time approached for the presentation of the alternatives I was conscious of increasing tensions about the eyes, brows, neck and chest, all of which seemed to constitute a process of adjusting myself to the experimental situation. Again I had visual imagery of white cards located behind the aperture, together with eye-movements or shifts of my line of regard from left to right and up and down. [These experiences in the fore-period are typical of *Observer C* who habitually imagines himself in the act of choosing, before the alternatives are presented. It is interesting to note that these processes are syncopated prototypes of this observer's mental processes in later periods of the act of choosing.]

5. Series 1. *Observer J.* I listened attentively to the instructions and at the same time was conscious of slight tensions about the face, in the throat and neck; I had visual images of vague forms, resembling pictures, localized on the background behind the screen; the forms were whitish and panel-shaped; I found that my line of regard was first directed to one and then to the other, the fluctuations occurring very rapidly and continuing for some little time. Then these whitish panels became definitized into visual images of two groups of sculpture; the one on the right was "The Wrestlers" and the one on the left was "Discobolus"; my regard continued to fluctuate but now more slowly, and the tensions about my face and eyes became more intense. Then one of the pictures would fade away and I found myself fixating a black background; the other faded in the same manner; then both images would return again. Together with all these experiences I was conscious of a tendency to sit more erect in my chair, of stiffening my shoulders, of expanding my chest, of taking a deep breath, and of a wide-spread bodily rigidity. All this was accompanied by a very pleasant affective toning. I then had fleeting visual imagery of the muscles on the bodies of the athletes, together with a heightened awareness of my own bodily rigidity, especially in the arms, shoulders and chest. Then I wondered if the experimenter would show me these two pictures; this consisted of a re-appearance of the pictures in visual imagery, together with visual imagery of the experimenter with his arm outstretched as if to pull aside the screen, and of the vocal-motor-auditory: "Wonder if (he will give me) these two." Then the scene changed and I was momentarily aware of visual images of a large room, very well furnished, with reproductions of these two works of sculpture situated in front of a broad stair-case. At this time I had a feeling of great admiration for these athletes and a desire to have both of these groups of sculpture in my room—experiences which were very fleeting and telescoped but rich in organic and kinaesthetic processes. I found my regard shifting constantly from one of these imaged groups to the other; I had kinaesthetic imagery and incipient movements of taking a deep breath; auditory and kinaesthetic imagery of sighing, organic sensations from the region of the diaphragm, intensive pleasantness, and auditory imagery of my own voice: "Oh, I would like to own reproductions of these." Just then my attention was suddenly claimed by the experimenter's ready signal; I was aware of focusing the screen, of intensive strains about the eyes, shoulders and chest, of

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tensions in the throat, of incipient tendencies to sit more erect in my chair and of marked tendencies to turn my regard first to the left and then to the right in front of me. [It is clear from the above introspection that the reagent was experiencing an act of choosing in imaginal form and that as he heard the experimenter's voice giving the ready signal there was a widespread and immediate kinaesthetic adjustment which constituted a preparedness for the presentation of the alternatives and for the subsequent act of choosing. In no act of choosing was this initial preparedness entirely eliminated.]

2. Summary of Introspective Data. In temporal sequence, the first mental processes to appear were kinaesthetic contents resulting from a general rigidity of the sitting position in the chair, from tensions in the neck, about the face, brows, neck and jaws. The hearing of the instructions was sometimes followed and sometimes preceded by vocal-motor-auditory imagery of the instructions in whole or in part; then appeared anticipatory visual, auditory and kinaesthetic imagery of the materials which were about to be presented or like imagery concerned with memories of previous choices. In frequent instances the observers indicated by words or by bodily attitudes that they assented to or that they understood the instructions. As the time approached for the presentation of the stimuli there appeared kinaesthetic processes from leaning forward toward the region where the materials were to be exposed, with intensive fixations of visual attention upon the screen. Widely distributed, bodily strains increased in intensity and complexity until the alternatives appeared.

From a functional point of view the most significant feature of the fore-period consisted of a tendency to begin the act of choosing before the alternatives were presented. In all observers these tendencies were complicated by a background of bodily tensions, of muscular strains concerned with the fixation of visual attention upon the screen, of organic and kinaesthetic experiences concerned with changes in respiration and possibly circulation. The bodily tensions involved such motor adjustments as sitting more erect in the chair, leaning forward toward the aperture, incipient movements or tensions about the eyebrows, jaws, chest, trunk and sometimes in the legs. This kinaesthetic background is part of the anticipated act of choosing and at the same time constitutes a general "set" or "adjustment" of the reagent to the experimental situation—the apparatus, materials used, and the instructions. These activities of the fore-period, the tendency to choose in anticipatory fashion by going through the actual movements of choosing in incipient form, and the widespread motor adjustments, together constitute the acceptance of the *Aufgabe* and the clue to the functional

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significance of the fore-period. This preparedness to choose is essentially kinaesthetic; its core consists of motor processes which at once dominate the conscious content of the fore-period and bring the fore-period into functional relationship with subsequent periods in the act of choosing.

In a series of check experiments it was found that when the materials for the choice were presented without any instructions, the reagent invariably found it necessary to "accept" self-imposed instructions before he was able to progress in the experiment; or when one alternative was presented to the reagent with the usual instructions, to choose, he always found it necessary to add to the instructions before he could proceed. In each case the fore-period revealed that the essential feature of the reagent's consciousness, prior to the act of inspecting the stimuli, consisted of some group of kinaesthetic processes which could be intensified or elaborated immediately upon such inspection of the stimuli. In another series of check experiments, in which the reagent was asked to reject one of the alternatives instead of making a positive choice, he invariably did one of two things: If the instructions failed to arouse the proper initial motor responses, i. e., if they failed to change the kinaesthetic content of the fore-period, he made a positive choice; if in the fore-period his kinaesthetic processes were concerned with incipient tendencies to reject an alternative instead of being concerned with incipient tendencies to accept an alternative, he proceeded to fulfill the instructions correctly. It was under the one condition and no other, namely, that the fore-period contained kinaesthetic processes and incipient motor responses qualitatively similarly to those motor responses which later constituted the final act in the choosing, that the reagent could progress in the experiment.*

The relationship of the *Aufgabe* to the fulfillment of the *Aufgabe* is therefore, it would seem, more than one of association or of order of sequence. The acceptance of the *Aufgabe* seems to be, here, in essence, a motor response either to the stimulus of self-imposed instructions or of instructions imposed from without. This response involves muscular adjustments, kinaesthetic images and incipient movements, all of which not only resemble movements and adjust-

*When the fore-period did not contain sufficient adjustments toward rejecting both alternatives the reagent persisted in his attempts to find some reason for accepting one of them. In *observer A*, whose foreperiods revealed a lesser number of details of preparedness to choose than did the fore-periods of our other observers, we found the greatest number of rejections of both alternatives. Here the adjustments to choose and to reject were equally balanced.

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ments made after the presentation of the alternatives, but are such movements and adjustments as can "hang over" or persist and become intensified, elaborated, or partially modified as soon as the additional stimuli (alternatives) appear. The processes of intensification, elaboration and modification constitute the fulfillment of the *Aufgabe*, and are an unfolding, so to speak, of the initial and incipient response. Were it not for the fact that the fore-period and the subsequent periods in the act of choosing possess an increment of common motor adjustments beginning in the fore-period and continuing throughout the act of choosing, that act could not take place. Additional stimuli are necessary in order to prolong, unfold, intensify or elaborate the acceptance of the *Aufgabe* and these are furnished by the alternatives themselves or associations represented in consciousness by visual, auditory, or other images concerned with details of the alternatives.

C. *The Main-period.* 1. Introduction. Our observers' mental contents in the act of choosing were exceedingly diverse owing to their varied past experiences and to the widely different degrees of difficulty in choosing brought about by the same alternatives in the cases of different observers.

2. Choices whose difficulty was due to a conflict between vigorous motives. (a) Typical introspections.

6. Series 3. *Observer B.* Fore-period omitted. Music: Rondo from Serenade, op. 525 Mozart, played by the Victor Stringed Quartette; Wine Flow a Fountain, from Don Giovanni, Mozart, sung by Ruffo. . . . As soon as I perceived the words of the "Rondo" title I was conscious of a marked welling-up of pleasant affective toning, of an immediate tendency to smile, of a sudden suspension of breathing with accompanying strains in the chest; these experiences were then followed by a short but sharp exhalation and an adjustment about the throat and mouth to say, "Oh!" [In answer to a question by the experimenter: "When did you first tend to choose either title?" *B* reported that this initial reaction to the "Rondo" title consisted of a tendency to choose it.] I then looked down at the lower title, "Don Giovanni." I read it through, and noted particularly the name of the singer, Ruffo. As I perceived the name I was aware of intense pleasantness together with a kinaesthetic "set" toward the title. [This "set" constituted a tendency to choose the "Don Giovanni" selection.] Then the word "Mozart" came in, verbally, together with a faint visual image of the upper card; there was a momentary checking of the pleasantness and of the kinaesthetic reaction that had just developed in connection with the "Don Giovanni" title; for several seconds my line of regard fluctuated back and forth from one card to the other. [At this point may be observed a characteristic feature of this type of choice, namely a period of fluctuation of attention after the appearance of conflicting tendencies to choose both alternatives.] I then had visual imagery of the phonograph on the table with some phonographic records; for a brief time I was conscious that I wanted to hear both selections; this desire consisted of further tendencies for my eyes to wander back and forth over both titles with pleasant affective toning in connection with both, together with the visual imagery of the phonograph situation and the records. Then there was a brief period of suspense characterized by muscular strains about the shoulders, brows, mouth

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and eyes and by a vocal-motor self-questioning: "What am I to do? What do I know about the 'Rondo' selection?" [In this self-questioning may be observed the functioning of a subsidiary task of searching for more motives.] Then I had a vague and fleeting visual consciousness which had to do with previous experiences with Mozart's Serenade; this was followed by a visual image of a stage setting and glimpses of the prologue from "Fanny's First Play" where the old man figured; but all this lasted but a short time. I glanced back at the upper title but immediately became aware of a tendency for my line of regard to return to the lower title; my attention again repeatedly shifted from one to the other. By this time the tension in my throat, chest and face had become more intensive and widespread; I was conscious of an effort to represent to myself some reason that would make one alternative prevail over the other; the pleasantness disappeared and unpleasantness slowly developed; I read and re-read the two titles. At this juncture I became aware for the first time, focally, that the "Don Giovanni" was a vocal selection, and that the "Rondo" was not. My regard suddenly shifted to the name "Ruffo" in the "Don Giovanni" title; there was at this time a sudden "start" of pleasantness, again a sudden tension in the throat and chest, together with tendencies for my mouth to contract into a smile. The strains of suspense suddenly diminished, giving way to a welling-up or upward-pressing sensation extending from the chest upward into the throat. I then had the vocal-motor-auditory: "I always prefer a vocal selection." All this occurred while I was focally attending to the title. I then turned my head toward the experimenter and announced that I had chosen the "Don Giovanni" title. [A study of the numerous mental processes described in this introspection reveals the following important facts: The reagent found himself tending to choose each alternative in turn immediately after he had perceived it; both of these tendencies persisted and as a result he found his attention fluctuating rapidly from one alternative to the other. Even while examining one alternative he would find that his line of regard tended to return to the other. The fluctuations of attention seem to be the rapid appearances of the conflicting tendencies to choose. The motive for this decision was B's fondness for vocal selections. The contents of the motives and tendencies to choose and the content of the final motive and the final choice, are in each instance, one and the same. In this choice the earlier tendencies to choose "Don Giovanni" were modified and delayed by the tendency to choose the "Rondo" selection; both tendencies to choose persisted; the result was a conflict, a temporary delay and mutual inhibition. Finally the tendency to choose "Don Giovanni" was reinforced by the additional motive which was B's preference for vocal selections. Here the motive owed its origin to the perception of a detail which had hitherto been unnoticed. The fact that perception of added details of an alternative marked an increase in the intensity of the motor response already in operation, although a complex response, might indicate that a process like summation or an accumulation of the affects of different stimuli was going on. The original response or tendency to choose becomes the final decision, then, after having passed through stages or processes of delay, and summation. It remains to be observed whether this interpretation might hold for all acts of choosing of this type.]

7. Series 3. Music: Drinking Song, from *Cavalleria Rusticana*, by Mascagni, sung by Caruso; Mad Scene, from *Lucia*, Donizetti, sung by Tetrizzini. *Observer C.* (Fore-period omitted in this and following introspections.) The perception of the "Mad Scene" title was followed immediately by a welling-up of very pleasant affective toning, by a sudden appearance of strains about the chest, by a temporary holding of the breath, and by a jerky tension in the neck and arms. This kinaesthesia then developed into a leaning forward toward the title and into a more rigid fixation of my line of regard upon the card. While these experiences persisted I had visual images of the "Mad Scene," accompanied by fleeting auditory images of portions of the selection; by this time the affective and kinaesthetic content just described had become more intense and widespread. I then perceived the name of the singer, Tetrizzini; this was followed by a still more intensive motor reaction and by more intensive pleasantness than before; I was aware of sensations which seemed to come

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from heightened or excited circulation; I had kinesthetic imagery and incipient movements of leaning forward, farther, in my chair; then I was aware of relaxation of certain of the bodily tensions and of throwing my head back as if in a dreamy state of listening to her voice. Along with these latter processes were visual and auditory images of the singer and of her voice as she appears on the concert stage.

[The processes rescribed were subsequently interpreted by the reagent as a strong tendency to choose the "Mad Scene" selection and also as a desire to hear it.] Then I looked at the "Rusticana" title; this was followed by rapid auditory imagery of a few notes of the introduction to the "Intermezzo"; I then perceived the name, Caruso, and the remainder of the "Rusticana" title and here I had auditory imagery of Caruso's voice in the phonograph. These latter processes were accompanied by a mass of organic and kinaesthetic contents, of muscular tensions, sensations from respiratory and apparently circulatory changes, all of which meant to me a feeling of excitement; I tended to straighten up in my chair; more visual imagery of Caruso came into consciousness; the kinaesthetic and organic processes increased in their intensity and scope and were accompanied by marked pleasant affective toning. [These experiences were interpreted by the reagent as a tendency to choose the "Rusticana" title.] My glance then fell again upon the "Mad Scene" title and the visual and auditory imagery which I had had before now re-appeared, together with a similar organic and kinaesthetic complex; but breaking in upon these latter experiences came auditory and visual imagery of Caruso and a rich background of organic and kinaesthetic content associated with hearing his voice on the phonograph and with past experiences of listening to his singing. (All this meant to me that I was equally fond of both selections.) Then I was aware of the vocal-motor-auditory: "Which one of these shall I hear?" Then for seemingly a long time, visual and auditory imagery, together with the kinaesthetic and organic reactions concerned with both titles claimed my attention one after the other in long, drawn-out series; I began to find myself in an intensive strained condition; I had marked kinaesthetic sensations of tensions in the throat, about the eyes, brows, shoulders, arms, chest, and even lower trunk. Repeatedly, auditory imagery of Caruso's voice would appear only to be broken into and followed by auditory imagery of Tetrizzini's voice. The quality of the latter's voice was very clear; it was penetrating, intensely pleasing; pleasant complexes of kinaesthetic and organic processes accompanied and followed the rising and falling tones and inflections of her voice in rhythmical fashion. [The reagent interpreted these latter experiences as a conflict between tendencies to choose each selection.] Suddenly I became aware of the fact that I had never really heard Caruso; the content of this was a flashy visual image of Caruso on the stage, surrounded by a group of other singers; and a sudden welling of pleasantness with a focalization in consciousness of visual and kinaesthetic imagery of myself attending an opera. From this time on, visual and auditory imagery of Caruso dominated consciousness; there was a sudden increase in intensity and vividness of kinaesthetic and organic content; I had kinaesthetic imagery of myself walking down the aisle of an opera house with visual imagery of Caruso on the stage; I noticed that his chest was expanded; I became absorbed, momentarily, in auditory imagery of his voice. Accompanying these latter images were kinaesthetic and organic sensations from the region of the stomach and diaphragm, from inhibition of breathing, and from a marked rigidity of the muscles about my mouth and throat as if I were prepared to say something. I was then conscious of a general bodily relaxation; of a shift of attention to the experimenter; I then reported that I had chosen the "Caruso" title. [Here the content of the motive for the decision was identical with the content of the final decision, itself. In this series of experiments, C's acts of choosing very often took the form of an "adjustment" to hear the selection or the voice of the singer; this consisted of a complex of experiences identical with a desire to hear the selection in question. In this particular act of choosing may be observed the same general sequence of mental processes as was found in the previous introspection, namely, the alternating tendencies to choose, the conflict, the final reinforcing

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of one of the initial tendencies to choose and the subsequent bodily relaxation and shift of attention to the experimenter.]

8. Series 1. Pictures: Two Scenes from Nuremberg. *Observer A.* Upon the perception of the first picture there was a brief recognition of it, present to consciousness merely in the rapid vocal-motor-auditory: "Nuremberg," in slight pleasantness and in a focal perception of the picture. I then looked at the other picture and had the vocal-motor-auditory: "Oh! Nuremberg, too." Then my glance shifted back to the first picture again, which was at the left, and as I perceived the bridge across the river I was aware of the vocal-motor-auditory imagery: "Oh, yes, chopped up bodies and dropped them down," referring to the atrocities of the early wars. Then I turned again to the picture on the right; inspected it more carefully and had the vocal-motor-auditory: "Very pretty; very characteristic; don't remember where"; (Here I was indicating in verbal but syncopated fashion that I did not remember the exact location of the scene.) Immediately after this verbal characterization of the first scene which meant to me that it was pleasing and familiar, and after the subsequent characterization of the second picture which meant to me that it was both pleasing and characteristic, I found myself in a state of suspense and hesitation; my line of regard fluctuated rapidly from one picture to the other; then I would gaze fixedly at one and then at the other; both pictures grew in attractiveness; both were exceedingly pleasing. [Two tendencies are operating here, a tendency to choose each picture, and as a result, there is a conflict characterized by fluctuations of attention.] Suddenly and with a rapid and general bodily contraction, I had the vocal-motor-auditory: "Gee, hurry up;" after this the bodily strains increased very rapidly both in their scope and in their intensity; I was distinctly conscious of the strains of frowning, of tensions in the jaws and chest. Then I was aware of the vocal-motor: "Hang" (meaning to choose the picture which would be most appropriate for hanging in my room); I then turned to the picture which I had characterized as pretty; I was conscious of a diffused bodily "set" in the direction of the picture, together with the vocal-motor-auditory: "This prettier, take it." There was then an immediate bodily relaxation, a shift of my attention to the experimenter and a verbal announcement to him that I had made my choice. [The judgment, "prettier," constituted the motive for this choice as well as the final stage itself of the act of choosing. Its contents were the characteristic shift of attention and focalization of the attention upon the object chosen, the diffuse bodily "set" and the verbal characterization, "prettier." The subsequent verbal process, "take it" is characteristic of *Observer A* but is irrelevant to the act of choosing, for in many instances the bodily relaxation and announcing of the decision appear without such verbal imagery. The process of judging, appearing in the course of the act of choosing at this juncture, served to reinforce the initial and incipient tendency to choose the alternative in question. The kinaesthetic factors—general bodily "set," act of turning toward and fixating the given stimulus—constitute the motor core of this particular final decision.]

9. Series 3. Music: Oh, for the Wings of a Dove, Mendelssohn, sung by Farrar; Moonlight Sonata, Beethoven, played by Vesella's Italian Band. *Observer J.* I first perceived the title, "Oh, for the Wings of a Dove," noted particularly the "Oh," and had very distinct auditory imagery of it in terms of my own voice; I had progressed no farther than this in the perception of the title when there was a sudden internal muscular contraction in the region of the diaphragm and a very complex, general organic response. This consisted of a tendency for my mouth to open, of heightened circulation, of a pressure in the upper chest and about the surface of the face. Then, along with this kinaesthetic and organic response I had auditory and vocal-motor imagery of the remainder of the title preceding my visual perception of it. The "Mend—" of "Mendelssohn" stood out very distinctly in visual-verbal terms, the word being completed in auditory imagery; then I perceived the name, Farrar, whereupon I found myself tending to sit more erectly in my chair; there was a violent "sinking" sensation from the region of the stomach; accompanying this organic reaction was a long, drawn-out, but clear auditory image with

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incipient innervations of the speech organs: "Oh, this is a great selection"; along with this, also, I was aware of a tendency to take a deep breath and to sigh. I was at this time leaning back in my chair; my eyes were shut; for an instant I had a very clear visual image of the title as a whole (my eyes were then shut) localized directly in front of me at about a reading angle. [All these processes which occurred upon the perception of the title were interpreted by the reagent both as a tendency to choose this selection and as a great desire to hear it.] For an instant attention seemed to increase in its range and at once to take in focally the visual image of the title, objectified before me, and the kinaesthetic and organic complex which I was also experiencing at the time. My bodily self, the title, the space between me and the title were for an instant thrown into a complex kinaesthetic and visual *schema*; this represented to me that I was at this time tending to choose the "Mendelssohn" title, or that I was in the act of "accepting" this title as my choice. [*J* always spoke of this complex schema as an "attitude of acceptance."] As these processes were being thrown into this schema, I was aware of a long, drawn-out, breathy, auditory: "Oh, I want this"; the intonation and the emphasis in clearness of the imagery, together with marked pleasantness and a continuation of the kinaesthetic and organic complex which I have just described, seemed to mean to me an attitude of marked certainty. Along with all this I was conscious of a slight tendency to lean forward in my chair and to nod my head; the muscles about my eyes and mouth relaxed as if in smiling; then my attention shifted to the experimental surroundings only for an exceedingly brief instant; relaxation of this kinaesthetic and organic response began to appear. [At this early period in the process of choosing, a tendency to choose one of the titles had developed so suddenly and was so intensive as almost to constitute a final decision; the reagent tended to relax; his attention began to shift from the materials of the choice to the experimental surroundings, as is characteristic immediately after the final decision. This tendency is very characteristic of *J*'s most vigorous tendencies to choose.] Just then, however, a flashy visual image of the two cards in front of me suddenly appeared; there was a sharp checking of this tendency to relax; for an instant I was aware, focally, of the table and screen before me. [*J* subsequently interpreted this awareness as a consciousness of the task. Note that its content consists of visual imagery of the cards and of a vocal visual awareness of the experimental surroundings. This type of task-consciousness is not only characteristic of *J* but of many of the other reagents.] I then perceived the other card but while doing so the kinaesthetic and organic response that had developed in connection with the other title came in again with a rather high degree of clearness and intensity; I then read "Moonlight Sonata"; this was immediately followed by an organic and kinaesthetic response very similar in nature to the first (a tendency to choose the "Moonlight Sonata" title) but before this response developed very far I was aware of the other title in visual imagery; I had in the meantime forgotten just what the other title was; I turned my line of regard in the direction of the other card but perceived only the word "Oh," when the organic and kinaesthetic processes indicating my great fondness for that selection as well as a tendency to choose it, all came rushing into consciousness again. Here, as before, these processes consisted of a long in-take of the breath, of a tendency to sigh, of a marked contraction in the region of the stomach or diaphragm, of incipient tendencies to sit more erectly in my chair and to lean forward, of tensions in the throat and the neck certain of which might have been incipient movements of nodding. All of these experiences took place so rapidly and were so complex that it is almost impossible to describe them in detail; so fast had these processes developed that I was still aware of, or my attention was still lagging somewhat on the progressing tendency to relax after the initial perception of the "Mendelssohn" title. Now, upon the perception of the "Mendelssohn" title the second time and upon the perception of the second title, both of which perceptions had occurred in rapid succession, this tendency to relax had been checked, suddenly. I was conscious of a very marked but incipient tendency to choose the second title and this, in turn, was checked when I re-perceived the first title. I now felt as if my whole body had been thrown, suddenly, into a

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very intensive strained and contracted condition. [These latter experiences are striking examples of the suddenness and rapidity with which tendencies to choose develop and are inhibited.] At the outset this strained condition consisted of very marked tensions of the external muscles of the abdomen, of a sudden tendency to pull my shoulders together, of tendencies to sit more erect in my chair, of facial contractions of surprise, of tendencies to hold the breath with my mouth slightly opened, and of rigid staring, blankly, at the two titles. I exhaled sharply; my attention lingered on the developing tensions in the abdomen; I then noticed strains of frowning and squinting, strains in the jaws and throat; marked unpleasantness developed; my line of regard then began to flit rapidly back and forth from one card to the other; I then had the verbal process: "Gee, this is a difficult choice"; for some little time all imaginal processes ceased; I again stared first at one title and then at the other; as I alternately perceived each title the kinaesthetic and organic processes of my earlier tendencies to choose gave way to these intensive strains about the brows, face, neck, shoulders and trunk. Breathing became irregular. [So far in the act of choosing, then, there has developed a conflict between two tendencies to choose and as a result each tendency has been delayed or inhibited.] Then I resumed my inspection of the titles; as my glance fell upon the word "Dove" in the "Mendelssohn" title, a kinaesthetic and organic complex, again constituting a tendency to choose that title, commenced to develop when I suddenly became aware that I was not consciously fulfilling the *Aufgabe*; this was present in terms of kinaesthetic imagery of leaning forward, slightly, of drooping the shoulders, and of the vocal-motor: "What a fool to choose anything without a reason! Can't do it rationally." Then, as before, there was a rapid alternation of my line of regard from one title to the other with a continuation of the tensions and of the unpleasantness. Then as my glance lingered for an instant on the "Beethoven" title I had a series of visual images of the score of the Moonlight Sonata, pleasantness, and a slight tendency for an attitude of acceptance to develop; along with these visual images, I had auditory imagery of the first movement as played on the piano. Here I became aware that I wanted to hear something besides vocal selections; this consisted of visual imagery of seeing a record placed upon the phonograph, of auditory imagery of hearing an instrumental selection, of marked pleasantness and a re-appearance of the motor tendency to choose the "Beethoven" title. But this tendency was again checked as I became aware of the verbal process; "But this is not an orchestra, this is a 'cheap' band." At this time the kinaesthetic and organic processes which constituted my attitude of acceptance suddenly diminished and relaxation tended to set in. For what seemed a long time motives for and against the "Beethoven" selection came into consciousness in rapid succession; I was then aware of visual imagery of the words, "Vesella's Band" standing out vocally in consciousness; these suddenly gave way to the verbal process: "But my friends would like to hear one of these band selections for a change"; and yet again the motor reaction of acceptance tended to appear; then I had: "But after all, my friends would not like to listen to poor music" came in verbal terms; and the tendency to accept the title suddenly shifted to a motor tendency to reject it. . . . These vocal-motor processes were accompanied by flashes of visual imagery of people standing about a room as if listening to the music from the Victrola. Then visual imagery of the "Mendelssohn" title came in again with the verbal process: "Oh, take it," followed by. "We have several vocal selections, but Farrar is good and the other selection is a poor one"; simultaneously with these vocal-motor processes, which were exceeding rapid and synopated, there appeared incipient tensions in the throat, marked pleasantness, the beginning of a tendency to take a deep breath, a slight sensation of pressure in the upper chest which rapidly shifted upward into the throat, and the complex visual and kinaesthetic schema in which I am conscious of accepting the selection. All these latter processes, however, were rather non-intensive, relatively, and while they were in consciousness I was at the same time aware, non-focally, of the "Beethoven" title and of the slight residue of strain continuing from persisting tendencies to choose that selection (interpretation); as my attention

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lingered momentarily upon these strains, they seemed to increase slightly in their clearness and intensity. Then I found myself relaxing; but this relaxation developed slowly; there was through it all an unpleasantness which seemed to be referred to my awareness of the equality of the attractiveness of the two selections in general. At the very last I was conscious of the "Mendelssohn" title in visual imagery with flashes of auditory imagery of the aria in "Oh, For the Wings of a Dove," together with the accompanying organic and kinaesthetic processes of acceptance. I then turned to the experimenter and began to introspect. [The choice here described is typical of this reagent who in all difficult choices is aware of rapid alternations of tendencies either to accept both alternatives or to accept and then to reject the same alternative. The great rapidity and suddenness with which this reagent first tends to choose one alternative and then the other is strikingly illustrated in the first part of this introspection where tendencies to choose the first alternative developed immediately upon perceiving it; relaxation commenced; he found himself tending to choose the second alternative and then the first a second time, all before his attention had entirely left the tendency to relax from the initial response. In the latter part of this introspection there is a peculiar phenomenon characteristic only of this observer, namely, the tendency to change the *Aufgabe* from: "Choose which selection you will hear on the phonograph" to "Choose a selection to play to your friend." This change of *Aufgabe* appears only in the most difficult choices where all other motives seem, for the time being at least, to have been exhausted. In this introspection we again find the invariable identity between the mental content of the motive and the mental content of the tendency to choose or the final decision. In other words, the mental processes which constitute the motive, no matter what their content, such as verbal processes, kinaesthetic and organic processes involving the throat, chest, and the like, or both, may be interpreted in two ways: they may consist of the contents of the reagent's awareness of his reason for choosing or they may constitute the content of the actual activity of choosing itself. The content never constitutes one and not the other, but always both or first one and then the other, depending upon the direction of the reagent's attention. This choice also illustrates another invariable situation in this type of choosing, namely, the persistence of one tendency to choose while the other is being selected, i. e., in the final decision, which consists of a motor reaction to one of the stimuli, the reagent finds himself tending to react to the other stimulus also, and as a result, he is conscious of persisting tensions and unpleasantness, depicting the prolonged conflict of the two responses. Here it may be observed that the reagent found it necessary to impose upon himself the subsidiary task to choose for a serious reason. This followed a consciousness of a tendency to finally accept the "Mendelssohn" title after perceiving the word "Dove." The acceptance of this subsidiary task served to prolong the act of choosing and was followed by repeated appearances of tendencies to choose both selections. The motor "set" or "adjustments" of accepting self-imposed instructions function in the same manner as do the "adjustments" of the fore-period; in fact they amount to the introduction into the main-period of a fresh recurrence of the fore-period and constitute a sufficient modification of it to prepare the reagent for continued activities in choosing. This seems to make possible added responses to added stimuli, perhaps by opening up more elaborate associated patterns of responses which can be added to the responses which are already in operation. In this way, the process of reinforcing an incipient tendency to choose, or the process of summation or accumulation is made possible when otherwise the progress of the act of choosing seemed to be at a standstill.]

10. Series 3. Music: Barcarolle, from Tales of Hoffmann, sung by Farrar and Scotti; the Miserere, from Il Trovatore, sung by Caruso, Alda, and the Metropolitan Opera chorus. *Observer E.* I first perceived the "Barcarolle" title and together with a sudden "clearing-up" of the visual perception I was aware of marked pleasantness and of a feeling of familiarity; when I perceived the word "Hoffmann" I had flashy visual imagery of the pianist as he was seated at the piano. Then I noted the names of the singers, Farrar and Scotti; the feeling of familiarity with this selection increased; I had "tin-

gling" sensations which seemed to be distributed over my entire body; and as these "tingling" sensations persisted I had visual imagery of a red phonograph record and of my room at Carolina, my room-mate's phonograph on a table in the corner. During this time pleasantness was constantly increasing in intensity. Then I had visual and kinaesthetic imagery of myself seated before the phonograph in this room; the word "Scotti" came to me in auditory imagery and I had visual imagery of seeing him in his characteristic singing pose. Here the feeling tone, the kinaesthetic and tactual sensations of bodily "tingling" increased and I found myself saying in verbal imagery: "I want to hear this one." [The observer subsequently described these experiences both as a tendency to choose the "Barcarolle" title and as a fondness for that selection.] Then I asked myself in vocal-motor-auditory imagery: "Do I really want to hear this?" and the answer to this question was a "welling-up" of pleasantness, of tensions in the throat, arms, chest, a sensation of warmth referred to the region of the diaphragm, and faint visual imagery of the phonograph. All this meant to me an "adjustment" to hear the selection. Then I had the verbal process: "Why do you want to hear this?" together with recurring organic and kinaesthetic bodily "tingling" and with waves of pleasantness. I was then conscious that I seemed to be in the act of choosing the "Barcarolle" title. I then had a faint visual imagery of the other title and the vocal-motor-auditory: "Better look down to see what the other title is; it may be as good as this one; it may be better." The perception of the "Trovatore" title was instantaneous and was accompanied by marked pleasantness; there developed immediately a complex of kinaesthetic and organic processes consisting, again, of "tingling" sensations distributed over my entire body, especially about the trunk and face, of sensations of muscular contraction in the region of the diaphragm, and accompanying these experiences were auditory images of portions of the Miserere. I now found myself tending to sit more erectly in my chair; the organic and kinaesthetic processes increased in their scope and intensity; pleasantness increased, and I found myself saying in vocal-motor imagery: "I want this one." [Note that up to this time the reagent has been experiencing a tendency to choose one title and that this was followed by a similar tendency to choose the second title. Both tendencies followed immediately upon perceiving the titles.] My attention was then claimed by kinaesthetic and organic processes having to do with the other title; my line of regard shifted slightly in the direction of the other card; the verbal process just described was interrupted suddenly by the consciousness that I had just previously been on the point of choosing the other selection. Then I was aware of an attitude of doubt or hesitation; this consisted of very unpleasant affective toning, of tendencies to frown, to close my eyes, of intensive strains about the eyes, brows, face, shoulders chest, and in the throat; I was conscious of running my fingers backward through my hair; and was aware of an alternating series of visual and auditory images pertaining first to one of the selections and then to the other; my attention continued to shift from one group of experiences to the other until I noted a greater degree of pleasantness and more intensive organic and kinaesthetic reactions in connection with the "Trovatore" title than with the "Barcarolle"; the former became more and more persistent and intensive. Just then I was conscious of slight tendencies to relax, of incipient tensions in my throat and about the mouth, of slight movements of the head and neck in the direction of the experimenter; simultaneously with these latter movements I had the vocal-motor-auditory: "I will take the "Trovatore" title; here my attention was momentarily absorbed with the kinaesthetic and organic sensations constituting my fondness for the "Trovatore" selection; I had a series of very clear, rich, auditory images of the first few measures of the Miserere; the muscles of my face relaxed; (all this seemed to be an "adjustment" to hear the selection); but this reaction suddenly gave way to the verbal process: "Do I really want to hear this?" The answer to this was a rapid shift of my line of regard back to the "Hoffmann" title; here I had a brief consciousness of my former favorable reaction to it and the experiences were pleasant and intensive; but my mind went back immediately to the "Trovatore" title again; the mass of organic and kinaesthetic "tin-

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gling" sensations came in with seemingly greater intensity and clearness than before; sensations of muscular contraction and of warmth from the diaphragm and viscera grew more pronounced; there appeared incipient tendencies to lean forward toward the title; tensions increased in the throat, about the shoulders and chest; all of this was colored by intense pleasantness. I immediately turned to the experimenter and said I had chosen the "Trovatore" selection. (My choice seemed to consist of the organic and kinaesthetic processes together with the visual and auditory imagery associated with the title.) [Characteristics of *E*'s choices include conflicting tendencies to choose both alternatives, interrupted by repeated self-questionings. This self-questioning functions as a subsidiary task, and is a substitute for "Choose for a serious reason." Here again, motives, tendencies to choose, and the final decision itself are all similar in content throughout the act of choosing.]

11. Series 3. Music: Crossing the Bar, Tennyson-Willeby, sung by Evan Williams; Evening Star, from Tannhauser, Wagner, played on the cello by Sorlin. *Observer D*. I first perceived the "Evening Star" title and as my eye glanced along the card I repeated each word in auditory imagery. This was accompanied by a rapid onset of pleasantness, together with a feeling of familiarity. The familiarity consisted of the emphasis with which I read the words, of the pleasantness and of the focal clearness with which the visual perception of the words came into consciousness. I then read the other title and very much the same series of experiences developed; then followed the vocal-motor: "Well, both are good; both poetic; which do I want? This is going to be a difficult choice; both are good, I am sure." For a short time I was aware of strains about the jaws, eyes and in the throat; then followed the verbal process: "Now let me see the first title again." I turned to the upper card; I read it over carefully and came to the name, Wagner, which I had not noticed before; then I was aware of a kinaesthetic "jerk" which seemed to pervade my whole body; I noted kinaesthetic tensions and incipient movements of leaning forward, slightly; my line of regard remained fixed upon the composer's name; sensations came in of moving my body slightly forward and upward; at this juncture appeared the verbal process: "Well, I know this is good; better take the one you are certain of;" this was accompanied by marked pleasantness. I then turned to the experimenter and said: "I will take this one." [The reagent subsequently remarked that his actual decision seemed to have been made at the time when the muscular "jerk" or widespread motor response appeared and that he was conscious of a general bodily relaxation immediately following this motor response. In this instance the final decision terminated in the verbal process of judging but the final choice began immediately upon the perception of the name, Wagner, as an immediate reaction to that name as a stimulus. Processes of judging, largely verbal in content, are characteristic both of the choices of *D* and *A*; both observers report that subsequent verbal imagery such as "Take this one" etc., do not appear to be important in their acts of choosing but that the essential factors are the kinaesthetic processes of general muscular reactions in the throat, neck, chest, arms, shoulders, etc. The act of choosing, above described, illustrates a type in which the final decision is ended by a motor response to a new stimulus, a detail of the alternative hitherto unnoticed.]

12. Series 3. Music: Rondo, from Serenade, op. 525, Mozart, played by the Victor Stringed Quartette; Selections from Natoma, Victor Herbert, played by the Victor Orchestra. *Observer J*. As my line of regard fell upon the "Rondo" title, I was aware of a feeling of intense pleasantness, of slight relaxations of the muscles about the eyes and mouth, of numerous visual and auditory images which flooded consciousness, most of which imagery had to do with previous times when I had heard this selection; the visual imagery included the phonograph, experimental surroundings, and someone placing this record on the machine; the auditory imagery included parts of the "Rondo" selection with fleeting tones from the flute and stringed instruments; this latter auditory imagery was accompanied by fleeting visual imagery of a printed score on which stood out long, repeated runs of sixteenth notes. While all this was happening I was also aware of a very rich and complex motor and

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organic reaction, consisting of sensations from circulatory changes, respiratory changes, sensations of pressure and hollowness from the region of the stomach and diaphragm, of tensions in the throat and chest. (All this meant to me that I was tending to choose the "Rondo" selection and also indicated a great fondness for this particular selection.) Then, breaking into these experiences, was a visual awareness of the other title just below; my glance fell upon the first word only, Natoma; my attention remained fixed upon it for an instant while there developed auditory-vocal-motor imagery of the word, a slight inhibition of breathing, strains in the chest, incipient tensions of muscles in the back of the throat, slight contractions in the region of the diaphragm and external muscles of the abdomen. (Here I was experiencing extreme fondness for the "Natoma" selection and also a tendency to choose it.) All this was followed rapidly by auditory imagery of portions of Natoma, of visual imagery of the Dagger Dance, where Indians were dancing about a dagger which had been stuck, point down, into the ground; two Indians were trying to prevent one another from grasping the hilt of the dagger while at the same time they were twisting their bodies, arms and legs in graceful curves as they swung about the dagger in circles. I had auditory imagery of the rhythmic beating of drums. For a brief instant I was absorbed in this series of vivid and persistent images. Suddenly I became aware of the experimental surroundings and of the auditory-vocal-motor process: "Choose"; I found myself straightening up in my chair; very intensive strains developed about the chest and abdomen, in my arms and shoulders; my attention then shifted to the cards in the aperture although I had not been entirely unaware of their presence. [These latter experiences constituted an awareness of the instructions.] For some time my attention wandered back and forth from one title to the other; the task-consciousness re-asserted itself repeatedly in the form of a heightened awareness of the experimental surroundings, the screen, table, and myself sitting in the chair; marked tensions developed about the face, in the throat and shoulders; I was aware of frowning; the tensions everywhere grew very intense; unpleasantness developed. Such experiences as these continued for a long time; I was then aware of a feeling of suspense and of helplessness consisting of incipient tendencies to sigh, of marked unpleasantness, of a visual-kinaesthetic awareness of myself sinking dejectedly in my chair. My attention was then claimed alternately by the cards in the aperture (task-consciousness) and by my state of suspense and helplessness. Then came a long series of vocal-motor-auditory processes in which I characterized the choice as a very difficult one, and in which I remarked to myself that I could not understand how anyone could choose when the alternatives were so evenly balanced. This series of verbal processes terminated in the expression: "Get all the associations you can; recall previous experiences with these selections; compare your enjoyment of each;" attention then shifted back and forth from one card to the other while only the slight strains from the eye-movements and incipient head movements together with visual perceptions of the titles and of the two cards were present to consciousness, aside from my awareness of general bodily strain. I seemed to be unable to find any additional motives for choosing; each time my regard fell upon one title I was conscious of tendencies to shift to the other; on each repeated inspection of the titles I was conscious of the incipient motor and organic reaction which constituted a tendency to choose each in turn; each time I looked at either title I was assuming a favorable attitude toward it, which would be checked by a correspondingly favorable attitude toward the opposing alternative. Doubt and hesitation, with unpleasantness alternated with tendencies to choose and with pleasantness. Then I had the vocal-motor: "One is just as good as the other; what shall I do?" Suddenly, without any warning, I had the vocal-motor: "Mozart more classical" (I am particularly fond of classical music). This was followed immediately by two sets of processes: First, an exceedingly complex kinaesthetic and organic reaction consisting of muscular innervations of assuming a more upright position in my chair, of sudden contractions about the stomach and diaphragm, of a wave of pleasantness and warmth that seemed to pervade my whole body, of a loosening of the musculature about the mouth and eyes (in-

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ipient tendencies to smile), of strains in the upper part of the body as if I were momentarily holding my breath, of a wave of pressure originating in the upper part of the chest and shifting upward into the throat. All this time I was aware of the lingering auditory-verbal imagery: "Mozart more classical." The second group of experiences consisted of series of visual images of a large theatre as seen from a point above and about two-thirds of the way back from the stage, of faint auditory imagery of certain measures from the Serenade played by the flutes and violins, of visual imagery of the "Rondo" title as if I were reading each word from a printed page, the word "Mozart" persisting longer and being much clearer than the rest; and while these latter images were claiming my attention, I was still aware, in the "background" of consciousness, of the motor and organic reaction which I have just described; now these latter processes rushed into the focus of consciousness again; my attention seemed to expand in its range until I was aware, at once, of the details of the whole present situation—the title, myself in this complex motor attitude of accepting the title. (This peculiar behavior of attention in which both the the title and and the kinaesthetic and organic reaction claim equal degrees of clearness and in which the whole experimental situation becomes objectified in a visual kinaesthetic *schema*, constitutes for me an awareness that I am in the act of choosing or accepting a certain selection.) I found that I had risen slightly in my chair; my face was all smiles; I had kinaesthetic imagery with incipient movements of bending forward and of nodding my head as if in affirmation of my choice; my attention then shifted from the title to the experimenter as rapidly as it had just previously been directed to the title and motor reaction; I was aware of general bodily relaxation; and I began to introspect.

(b) Summary of Introspective Data.—Observer A was always in a hurry when he was making a choice. He employed verbal characterizations and comparison judgments with lightning-like rapidity; and in the earlier period of the choice his tendencies to choose always took the form of a fixation of attention upon the alternative in question, with increased tensions about the face and eyes, and of verbal characterizations which were always syncopated and telescoped. After these two original tendencies had developed and continued to claim his attention, he shifted his regard very rapidly from one alternative to the other during which period his verbal characterizations usually ceased, while strains about the face, brows, jaws, and in the chest developed to a high degree of complexity and intensity. These periods of conflict were relatively brief; they were followed by the subsidiary task, "Hurry," which involved verbal processes and a heightened awareness of bodily strains. He usually resorted to processes of judging which involved a rigid fixation of attention upon the alternative in question, kinaesthetic processes from a bodily "set" toward the alternative judged as "prettier," "more characteristic," "better," "more pleasant," etc., affective processes of pleasantness or unpleasantness, and verbal comments of various kinds. Then there usually followed such verbal processes as "Take that," "This one," or simply "This" and the like, which accompanied a general bodily relaxation. The process of judging which terminated the choices

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was usually one which up to this time had not occurred to him, but which now functioned in the same manner as did any motive which in case of our other observers resulted from the perception of some new and hitherto unobserved detail of the alternative. It is interesting to note, parenthetically, that observer *A* had but two visual images in over three hundred acts of choosing and that these were exceedingly fleeting and vague. The content of his experiences, therefore, was usually rich, relatively, in verbal and other kinaesthetic processes.

B's initial tendencies to choose each alternative in turn were always very vigorous and very rich in affective, organic and kinaesthetic processes. When such a tendency originated abruptly it involved short and deep inhalations with marked pleasantness, tendencies to smile, and sometimes vocal-motor tensions which culminated in such exclamations as "Ah!" "Aha!" "Oh!" etc. He occasionally described this incipient tendency to choose as a kinaesthetic "set" or "adjustment" toward the alternative in question, and when the incipient choice was less vigorous and contained fewer and less intensive motor reactions, he described it as a rigid fixation of attention upon the alternative with accompanying tensions in the throat and chest. At the period when the two initial tendencies first came into conflict with one another, *B* reported intensive strains about the neck, brows, and sometimes in the shoulders and chest; then he would experience an active searching for additional motives without being explicitly aware of the *Aufgabe* or of any subsidiary task. His final decisions always consisted of a mass of kinaesthetic processes similar in content to his earlier tendencies to choose but the former were sometimes complicated by processes of judging. The final decision often terminated in an intensive feeling of relief, especially if the act of choosing were an unusually vigorous one, or if the tendency to choose one alternative persisted while he was choosing another; and this feeling of relief was frequently expressed in a jovial or humorous exclamation.

Observer *C* always found himself in the act of choosing both alternatives in the earlier part of each choice but these tendencies were slower to develop than those of *A* or of *B*. His mental processes were characterized by a wealth of visual, auditory, kinaesthetic, organic, olfactory and tactual imagery. In series one, where pictures were the materials used, he was our only observer who reported olfactory imagery in his reactions to scenes or land-

scapes. As soon as observer *C* perceived a given alternative he was conscious of a "wave of pleasantness pervading his whole body" or a "feeling of excitement" or "exhilaration"; all of these complexes, however, were reducible to kinaestheses from circulatory and respiratory changes. He frequently reported sensations of warmth and pressure which seemed to spread over the area of his face, and down through the viscera from the region of the diaphragm. When an alternative was presented to him of which he was very fond, these kinaesthetic and organic processes became exceedingly rich and complex, involving a general and widespread bodily reaction. In long and difficult choices his opposing tendencies to choose were long and persistent; the mental processes aroused by either stimulus seemed to "rush in upon him" and he would find himself totally absorbed first with one series of auditory and visual imagery with their accompanying kinaesthetic and organic processes, then he would become equally as absorbed in the other series of processes. In the meantime, intensive strains would develop about the face, in his neck, chest, shoulders, arms, and abdomen, together with marked unpleasantness; and he would report that he was "trying to choose both stimuli at the same time." Then the mental processes directly associated with either alternative would begin to vanish; he would become conscious only of the muscular tensions and of the *Aufgabe*. This latter consciousness always involved an awareness of the difficulty of the choice and of a state of perplexity or embarrassment at his inability to reach a decision. In certain instances the perception of a new feature of one of the alternatives would at this time initiate a renewed tendency to choose it and the conflict would end as the result of the increased reaction to the alternative in question. At other times one of the tendencies to choose would persist, increasing both in intensity and complexity until it terminated the conflict by overbalancing the opposing tendency; at still other times, however, both tendencies to choose were so equally balanced that the conflict seemed to be endless. In choices of this latter nature the final decision followed immediately upon an awareness of the task; he would find himself "involuntarily" choosing that alternative which happened to be claiming his attention at the moment the task-consciousness appeared; and in such cases he reported that he "chose the given alternative in order that he might escape from the strain of the conflict." *C*'s ultimate decisions invariably consisted of kinaesthetic imagery and incipient movements of pointing to one

of the alternatives, or of bending over and picking up one of the alternatives, or of some other objective way of designating the chosen stimulus. These experiences were accompanied by marked tensions in the neck, arms and trunk, together with tendencies to turn toward or to point to the opposing alternative as if in the final decision itself he were "still trying to choose both alternatives at once." Observer *C*'s mental processes in general are very rich in kinaesthetic elements. In cases where the conflict of tendencies to choose was unusually persistent and vigorous he sometimes experienced a "feeling of being hurled through space," accompanied by a sensation of "dizziness."

D, like *A*, made most of his choices in verbal terms with bodily kinaestheses. In the earlier part of the main period, his incipient tendencies to choose consisted of sudden feelings of familiarity, of rigid fixations of attention upon the stimulus, of brief verbal characterizations and of general, short-lasting, but vigorous bodily tensions. During the period of conflict he was conscious of strains about the eyes and forehead which were frequently accompanied by chest or abdomen strains from irregular or momentarily inhibited breathing, and of verbal characterizations of the choice as difficult. His subsequent consciousness of the *Aufgabe* usually took the form of a verbal question: "Which shall I take," "which do I want," etc., and his final decisions usually resulted from a perception of some new detail of one of the stimuli or from a process of judging the relative merits of the two alternatives. He described his tendencies to choose and his final decisions as "muscular jerks"; these always accompanied his verbal characterizations, his comparison judgments, or his perceptions of a new detail of the alternative; they consisted of renewed tendencies to choose a certain stimulus; they always appeared, in processes of judging, as the kinaesthetic core of that act of judging, appearing as the content of that moment in the judgment when a difference between the two alternatives was being detected and constituted the motor "set" or "adjustment" giving direction at once to the judgment and to the act of choosing, terminating both. On the whole, his experiences lacked the complexity and intensity of organic and kinaesthetic content which were typical of the majority of our observers, a condition due perhaps to the fact that *D* seldom reacted emotionally to any of the experimental materials.

Observer *E* described his tendencies to choose as a "tingling" over the whole body, which was a complex kinaesthetic and organic

reaction involving circulatory and respiratory changes of a profuse and varied character, a "welling-up" of pleasantness, and kinaesthetic sensations of sitting more erect in the chair. This complex also involved series of visual and auditory images having to do with previous experiences with the alternatives. He was almost invariably aware of these tendencies to choose, as such, when they reached their height of intensity and complexity; he then had such vocal-motor imagery as: "I want this one," "Well, I am on the point of choosing this one," "Oh! I am about to choose this one," "well, I have just about chosen this one," and the like. He would then ask himself why he wanted this particular alternative, or if he really wanted it; and the answer was a reinstatement of his previous tendency to choose it. In the period of conflict he was conscious of intense muscular tensions about the face, neck, shoulders and chest; he sometimes scratched his head or ran his fingers through his hair, or shifted his position in his chair; all this was usually followed by a process of comparing the intensity and complexity of his two tendencies to choose. His final decision then took the form of estimating or of noting which tendency was the stronger, the more persistent or the more pleasant. In many instances, when on the point of rendering his final decision, he would impose upon himself the additional subsidiary task of comparing the merits of the two alternatives once more before reporting his choice to the experimenter; but his final act of comparing served only to strengthen the outcome of the first comparison judgment. Each subsidiary task and process of judging involved motor reactions which seemed to add their quota to the intensity or complexity of the response to one of the alternatives. If this response did not actually gain in intrinsic intensity and complexity, it seemed to provide a means for inhibiting an opposing tendency, thus gaining, relatively, over its opponent. Here, again, may be observed a process common to all of our arts of choosing of this type, which is not unlike the process of summation, perhaps, found in reflex action. Finally, *E* always chose very deliberately; he always imposed upon himself the subsidiary task to inspect each alternative even to the minutest details.

Observer *F* never chose hurriedly; she employed an abundance of verbal imagery; her usual procedure consisted of comparing one alternative with another, meanwhile talking to herself as if in conversation with another person. Her periods of conflict were less intensive but were prolonged and involved slow and deliberate fluctuations of attention from one stimulus to the other. Her final

decisions terminated in an act of judging except in rather infrequent cases where a tendency to choose one of the alternatives persisted in virtue of its dominating kinaesthesia, and constituted her final decision in spite of her efforts to delay it by comparing one alternative with another.

Observer *J*'s procedure throughout the entire course of the act of choosing consisted of rapid and abrupt vacillations between vigorous tendencies to choose first one stimulus and then the other. These tendencies were exceedingly rich in kinaesthetic and organic contents and involved strains in the throat, chest, abdomen, incipient tendencies to sit more erect in the chair, to open the mouth slightly, to lean forward, to nod; it also included organic processes from the regions of the stomach and diaphragm and oftentimes the viscera, which latter were often fused with sensations of warmth which the reagent referred to heightened circulation. A common feature of this complex consisted of a strain or pressure which always appeared first in the region of the upper chest and extended like a wave upward into the interior of the throat. In this respect, *J*'s reactions were strikingly similar to those of *B*. Again, as with *B*, *J*'s experiences of pleasantness were invariably associated with incipient tendencies to smile, with loosening of muscles about the eyes, and with sudden and sharp inhalations. When these various processes reached their maximal intensity or complexity *J* was always aware of himself in the experimental situation and he invariably interpreted this awareness as "an attitude of acceptance" or as "an acceptance of the alternative." His tendency to choose either alternative developed so rapidly and was so intensive that after the two tendencies had once been stimulated he found himself in a state of wide-spread muscular tension which he frequently described as "being thrown abruptly into an intensive bodily strain"; at this point his imaginal processes ceased and he became conscious only of the strains and of "staring blankly at the alternatives" before him. This period of conflict was followed by an awareness of the task in terms of a heightened consciousness of the experimental surroundings, of visual imagery of the two alternatives and the like; these experiences were often accompanied by visual-verbal or auditory verbal imagery of the command, "choose." The longer the process of choosing was delayed, the more verbal it became, although as a rule verbal processes were relatively unimportant in *J*'s acts of choosing. He seldom imposed upon himself the subsidiary task to compare the two alternatives unless the choice

were unusually long and difficult; his final decision consisted of a complex motor and organic reaction resulting from the perception of some new detail of the alternative as a new stimulus, or occasionally from the process of judging; the intensity and complexity of this latter reaction usually surpassed the intensity and complexity of any previous or incipient tendency to choose and it always was more intensive and complex than was the present opposing tendency. Such complex and intensive kinaesthetic and organic processes as have just been described failed to show any signs of simplification as the series of experiments progressed, as long as the acts of choosing were "vigorous" and "genuine."

In choices of this type the mental contents of the general task-consciousness and the awareness of a subsidiary task were exceedingly variable from observer to observer; moreover, a consciousness of the task need not necessarily include processes concerned explicitly with the instructions which were given at the beginning of the fore-period. Certain non-specific contents, in virtue of their context in the act of choosing, were interpreted by the reagent as a form of task-consciousness. Observer *C* was aware of the task in terms of visual imagery of the experimenter looking at him over the rims of his glasses or regarding him with an expectant expression on his face; at times he had visual imagery of the experimenter, behind him, together with intensive muscular strains; or he had visual imagery of the experimenter standing over him, together with kinaesthetic imagery and incipient movements of assuming a subdued motor attitude. Observer *B* reported visual imagery of the experimenter with pencil poised above a sheet of paper as though waiting for the reagent to dictate his introspection. *J* often experienced as a task awareness, visual images of an introspection written out on paper, or visual imagery of cards lying on the table, bearing the names of alternatives. Observer *E* very seldom experienced a final decision or a vigorous tendency to choose which he did not delay by the self-questioning: "Do I really want to hear this?" "Why do I want this alternative?" and then he would recall the nature of his previous tendencies to choose by "living them over" in attenuated or telescoped fashion; he would compare their relative intensity and complexity, the result of which invariably consisted of an "onrush" of the "flux" of kinaesthetic and organic processes which had constituted these initial tendencies, and a "reflex" shift of attention to the experimenter, together with an announcement of the choice. These latter activities were

the result of a subsidiary task to search for more motives but the task itself was not explicitly present in the observer's consciousness. Observer *F* was repeatedly aware of the *Aufgabe* in terms of complex and prolonged verbal expressions as the following: "Now, let me see; the right-hand alternative is attractive and so is the left-hand one; is there any detail that will make one prevail over the other? Examine the alternatives more closely in view of finding such a detail."

Subsidiary tasks may be arranged conveniently according to the degree in which the mental contents of these tasks reveal elaborations of the content of the general task "to choose." (a) The subsidiary task to "hurry" was a characteristic elaboration of the instructions and was a frequent occurrence in *A*'s choices. Here the actual content was largely verbal: "Gee, hurry up," with marked strains about the brows, jaws and chest. The condition under which this subsidiary task appeared was a conflict of tendencies to choose, or a state of doubt due to a lack of any tendency to choose. Observers *C* and *J* almost never elaborated the original instructions in this fashion until after they had become aware of the flight of time. (b) "Search for motives" was another subsidiary task characteristic of practically all difficult choices of this type. The reagent's consciousness of this form of *Aufgabe* was sometimes explicit as was usually the case with *D*, *E*, and *F* or it was implicit in the manner in which the reagent set about his examination of the stimuli as was characteristic of observers *B*, *C*, and *J*. An awareness of the equality of motives, or that no motive had yet been found, or that the choice was a difficult one were the usual conditions which initiated this form of subsidiary task. (c) "Choose for a serious motive" was a subsidiary task which functioned only in those acts of choosing where initial tendencies to choose possessed but little intensity or vigor, or where processes of judging were lacking; and they may be referred, undoubtedly, to the reagent's good will and interest in the experiment. (d) A fourth subsidiary task consisted of the *Aufgabe* to consciously compare the two stimuli. Unless the choice proved to be exceptionally easy this task was always implicit in the method of choosing employed by observers *A*, *E*, and *D*; but the task itself was seldom present to consciousness as such.

The final decision in the act of choosing varied in complexity and in intensity from observer to observer as did other periods in the process of choosing; moreover, different observers interpreted

their final decisions in different ways. *J* described his decisions as "attitudes of acceptance"; *B* described his as "kinaesthetic 'sets'" toward the stimulus in question; *A* called his decisions "aesthetic judgments"; *E* and *C* interpreted their decisions as "adjustments to hear the music" (series 3), as "adjustments to smoke" (series 2), as (adjustments toward having a certain picture in their room" (series 1); *D* called his final decisions "muscular jerks"; *F* spoke of her final decisions as "motor attitudes." It is not difficult to trace the reasons why our different reagents varied in their terminology. Certain terms can obviously be traced to their psychological training or belief, others to the way in which their experiences appeared to them, i. e., the localization of sensations, the order of appearance, etc., but the significant feature of all of their terms is the fact that each was essentially kinaesthetic, that each expressed the recognition on the part of the reagent that the vital feature of his choosing was its kinaesthetic content. In many instances the same contents were given different names by different observers until more elaborate analysis proved their identity.

The following introspective excerpts are here appended to illustrate the observers' mental contents in the final decisions in order to illustrate their variability and to point out differences between the essential and the non-essential features involved therein.

13. Series 3. Music: Barcarolle, from Tales of Hoffmann, sung by Gadski and Goritz; Elizabeth's Prayer, from Tannhauser, Wagner, sung by Farrar. *Observer J.* [The introspection given here and subsequent introspections under this heading begin with the mental contents of the final decision which followed a conflict of tendencies to choose. In this particular description the reagent has just perceived the names of the two singers in the "Barcarolle" title, a detail which had escaped his notice up to this time.] I perceived the names of the two singers in the "Barcarolle" title; the perception itself seemed to involve a sudden muscular contraction in the region of the throat which was followed almost instantaneously by contractions in the chest and abdomen, by a slight forward lurch of the body, and by the vocal-motor: "Oh, a duet!" The latter process was so vigorous that I almost innervated it. I was also aware of a slight tendency for my mouth to open, of tensions in the neck and shoulders; then I had exceedingly sketchy and rapid visual and auditory imagery of myself singing one of the parts of this duet with a friend, and flashy visual imagery of myself putting this record upon the machine. About this time I also had a very fleeting and exceedingly indistinct visual image of the other card; the image was "foggy" but the feature about it which claimed my attention was the fact that only one name appeared. (This might have been the beginning of a judgment consciousness that one title was a duet and the other only a solo, but the whole thing did not develop that far.) Before any of these processes had time to develop to a very high degree of clearness my attention was absorbed by an onrush of complex kinaesthetic and organic processes consisting of sensations from a tightening of musculature in the abdomen and about the region of the diaphragm, of incipient tendencies to smile, of slight relaxations of facial muscles about the eyes, and of strains in the region of the throat, probably in the vocal organs. At this time also I was aware of a wave of pressure and muscular contraction which began somewhere

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in the interior region of the chest and traveled upward into the interior of the throat where it became diffuse and vanished. [There now appears an interpretative period, characteristic of observer J.] Then I was focally aware of the two names in visual imagery of the long black letters before me, together with clear auditory imagery of the word, "duet," of the space between me and the objectified titles (I was not at this time looking at the titles) and of my body—the latter in visual and kinaesthetic terms. I noted the temporal sequence of these various groups of processes. First there stood out focally in consciousness the objectification of the names of the two singers; these remained vivid and clear while attention broadened to include a consciousness of the space between these objectified objects (names) and my body, this space including the edges of the screen and the table; thirdly, while these processes remained vivid and clear, attention increased its scope to include an awareness of my bodily self, involving kinaesthetic sensations, visually localized, about my throat, face, and chest. I was even conscious of eye-movements as I was successively localizing and objectifying these three sets of processes, visually; along with these eye-movements was a dim awareness of incipient head movements as well. All of this happened, I am sure, in the smallest fraction of a second. Then for an instant the organic and kinaesthetic processes predominated in consciousness; they lost their visual localization, that is, they were momentarily divorced from the visual-kinaesthetic schema; greater tensions developed in the throat and I had the long-drawn-out, vocal-motor-auditory image: "I will take this one." The verbal expression seemed but the verbal outburst of this same reaction. As the "I" was coming into consciousness in terms of this verbal imagery, the kinaesthetic sensations from the region of the face and throat stood out focally in consciousness and became visually localized again, but only for the very briefest instant; the remaining kinaesthetic and organic part of the reaction persisted as a complex and confused background. The auditory qualities of the verbal imagery were exceedingly clear and vivid, their clearness adding emphasis to the great vigor of the whole experience; they were not only clear but "round," "smooth," and "liquid" in character, making the timbre of the imagery exceedingly real and genuine; then, abruptly following upon these processes was a visual image of a large capital "I," equally vivid and clear; this happened while the auditory imagery was still lingering in consciousness; about the huge capital "I" was a background of bright, almost dazzling light, which momentarily flooded the entire field of vision and here the capital "I" faded or fused into the background of white light. (All this had happened before the visual imagery of the names of the two singers entirely faded from consciousness; describing these processes makes it seem as if the entire experience must have lasted much longer than it did, but the great complexity of the whole thing, together with the lightning-like rapidity with which the processes come and go, makes the description of them in verbal terms misleading.) It seemed as if what I had chosen was not the "Barcarolle" selection, but the names of the two singers, for they were the object of this complex response; the whole thing seemed to be an intense and complex reaction to that stimulus of the two names; or it seemed that what I had chosen was the motive that the selection was a duet. At no time after my attention first fell upon the names of the two singers was I aware of the real objective title before me. [In response to questions by the experimenter, J answered that he was totally unaware of any elemental consciousness of the self or of any elemental volitional process; this was one of the most vigorous and genuine of any of his acts of choosing; he was absolutely certain that it was as genuine and vigorous as any acts of choosing which might occur under actual, every-day conditions.] My mental processes beginning with a consciousness of my bodily self and continuing to the end when I began to introspect constitute my awareness of myself in the act of choosing. I am confident that there is nothing more there; the whole thing is very rapid and active; the activity consists of rapid shifts of attention and the rapid coming and going of various images and complexes of sensory experiences; attention shifts to take in first one great complex and then another in exceedingly rapid succession; the widespread kinaesthetic and organic reaction gives one an interpretation of excitement, the dominating features of

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which are sensations from the circulatory and respiratory changes, together with the persisting and intensive pleasantness.

Such analyses as these could be duplicated almost without number. In the more vigorous choices *J* always found that his consciousness of the self and his awareness of "willing" could be analyzed into complexes of experiences as stated above. Sometimes he found that the awareness of willing or of the self depended largely upon the clearness of the imaginal and sensory processes, or upon the exceedingly rapid succession with which they appeared, or upon the kinaesthetic and organic background; but never did the consciousness of the self or of willing resolve itself into a rigid and fixed synthesis of elemental contents or into any isolated mental content. The experiences thus named are a matter, for him, entirely of interpretation, the exact nature of the complexes depending upon the nature of the material used and other conditions of the act of choosing, of similar kind.

14. Series 3. Music: The Last Rose of Summer, Martha, sung by Alice Nielsen; March from Tannhauser, Wagner, played by the Victor Orchestra. *Observer C.* As I perceived the "Martha" title again I was aware of auditory imagery of Nielsen's voice as she sings the Last Rose of Summer, together with an intensive emotional reaction consisting of pleasantness, of increased pressure in the interior of the throat and chest, of kinaesthetic sensations in my chest, (from inhibited breathing) and of organic sensations from the lower trunk. I then had visual images of a recent experience in which I had heard the Last Rose of Summer sung by a personal friend; here the kinaesthetic and emotional reaction increased in scope and intensity, I was aware of an "adjustment" to hear the music of this selection. The adjustment consisted of kinaesthetic imagery with incipient muscular contractions of reclining in my chair, of auditory images of the selection, of faint visual images of the phonograph on the table before me, of persistent pleasantness, and of the organic sensations mentioned before, localized about the diaphragm. The "adjustment" ended in very clear kinaesthetic imagery and incipient movements of pointing to a record which I now visualized in the hands of the experimenter as he was in the act of placing a record upon the machine (all of this was my own visual and kinaesthetic imagery); at this juncture I was conscious of a general bodily relaxation and of a shift of my attention to the experimental surroundings.

C was frequently aware of himself in the act of choosing and this awareness usually appeared at the final decision; but as with *J* it was always present to consciousness, not in elemental terms, but in terms of kinaesthetic sensations and images, visually localized, involving the regions, usually, of the face, neck, arms and chest. This consciousness together with an awareness of organic (respiratory, circulatory and visceral) processes gave to the reagent's consciousness complex states which he interpreted as "feelings of activity, exhilaration, excitement" and the like. But here as before "feelings of activity" or any "awareness of the self" as such were

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not immediate experiences but interpretative and retrospective experiences, entirely.

15. Series 3. Music: The Mad Scene from Lucia, sung by Tetrzzini; The Drinking Song, from Cavalleria Rusticana, sung by Caruso. *Observer E.* I then had auditory imagery of Tetrzzini's voice as she sings in the Mad Scene; my attention lingered for a moment upon the high, clear tones of her voice; simultaneously with this there was a sudden and intensive kinaesthetic and organic reaction which soon absorbed my attention; this reaction consisted of tensions or incipient contractions over what seemed to be my entire body but particularly in the arms, shoulders, throat and chest; I found myself leaning forward slightly toward the title; I was conscious of marked pleasantness and of relaxation of facial muscles about the eyes; just then, however, these processes gave way to the vocal-motor-auditory: "Do I really want to hear this?" (For just a moment before I had been on the point of choosing the other selection.) This verbal process had no sooner appeared when I had, verbally: "Yes, this appeals to me more." Here came rushing into consciousness visual imagery of the phonograph, of Tetrzzini, dressed in white, rushing from one part of a stage to another; and here again the kinaesthetic and emotional reaction just described dominated consciousness; I then turned to the experimenter and announced that I had chosen. [In this final decision *E* is conscious of an "adjustment" to hear the selection, which adjustment is similar or identical in content with a desire to hear the selection as well as the content of the decision itself.]

E agreed with our other observers in reporting no elemental awareness of the self or of "mental activity" in the act of choosing. Experiences which this reagent has elsewhere called a "tingling" of the whole body constitute "feelings of activity"; these have been described, invariably, in terms of kinaesthetic and organic experiences.

16. Series 3. Music: Farewell to the Bright Vision, *Il Traviata*, Verdi, sung by Alice Nielsen; Elsa's Dream, Lohengrin, Wagner, sung by Gadski. *Observer B.* I was suddenly aware, again, of auditory imagery of portions of *Il Traviata*, together with a sharp welling-up of pleasantness, an awareness of incipient bodily movements of leaning forward in my chair, of holding my breath momentarily, and of strains about the jaws and the interior of the throat. At this point a wave of pressure developed in the interior of the upper portion of my chest and traveled upward from this region into the interior of the head, terminating in the region of the vocal organs. Then I was conscious of a slight tendency to exhale and to utter a delighted "Ah!" I then turned to the experimenter and announced that I had made my choice.

B likewise was never conscious, in elemental fashion, either of the self or of a feeling of activity. He found that the rapidity with which his attention shifted from one process to another, together with a background of kinaesthetic and organic processes, referred to circulation and respiration, were the basis of any tendency to interpret his experiences as feeling of activity. Sudden and vigorous fixations of attention, or the manner in which his attention seemed to treat the materials of the choice seemed, to this observer, to be the essential features of the act of choosing.

17. Series 3. Music: The River Shannon; Ave Maria. *Observer D.* As my attention returned to the "Ave Maria" title I was aware of the vocal-

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motor-auditory imagery: "I have not heard this selection for a long time; I heard the 'River Shannon' only a few days ago." Simultaneously with these verbal processes the "Ave Maria" title stood out very prominently in visual-perceptual terms; I was conscious of kinaesthetic imagery of leaning forward toward the title, of strains in my chest from hurried breathing, of contractions in the region of the diaphragm and of marked pleasantness. Then I was aware of complete bodily relaxation; it would appear from this relaxation that I was much more tense and that more contractions had occurred than I have just described; the processes just described were all that I found in my act of choosing; I then turned to the experimenter and announced my choice.

18. Series 1. Pictures: Two Japanese Prints (rooster and quail).
Observer A. Then my attention was concentrated upon the rooster; I had the vocal-motor-auditory: "Good; like Wilson's but plainer" (here I referred to a similar print which I had seen, recently, at the home of a friend). Then my attention shifted to the other picture and upon perceiving it again I was instantly aware of a general muscular rigidity, localized most clearly in the region of the jaws, brows and throat; I was aware also of the vocal-motor: "Gee, that's great; real symbolism; different from the other" (here I referred to a more realistic picture which I had just observed in a previous choice). I found myself gazing at this picture for what seemed several seconds; I was conscious of various attractive details concerning the coloring, lines, etc., of marked pleasantness, and of the vocal-motor-auditory: "Ah! Take it." For a moment I had forgotten that I was to choose and the last verbal expression seemed to be a return of my attention to the task at hand; the choice was certainly made at the time when my attention was so rigidly fixed upon the picture, with the sudden bodily rigidity.

Neither *D* nor *A* are conscious of the self or of a feeling of activity during the act of choosing. In fact such experiences never appear to them even in kinaesthetic or organic complexes. Both stated, upon questioning, that they were conscious of themselves or of mental activity after the final decision had taken place and relaxation had occurred, but agreed that this awareness was merely retrospective and interpretative and that under these latter conditions the awareness was one which the experimenter suggested by his questions and was not one which was characteristic of their acts of choosing.

Although the structural components of the final period in the act of choosing differ widely from individual to individual, they invariable contained kinaesthetic processes of some sort.

With the exception of *A* the kinaesthetic and organic contents of the final decisions were accompanied by such visual and auditory imagery as the following: A singer, a voice or voices, an operatic stage, an orchestra playing, different instruments playing, etc. (series 3); olfactory, gustatory, visual, kinaesthetic, tactual imagery of smoking cigarettes or preparing to light one, etc. (series 2); visual images of pictures or other representations of art in the observer's room, etc. (series 1). In the case of *A* verbal processes or comparison judgments took the place of the visual imagery. In our other observers verbal imagery was not infrequent.

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One reason for the variability from observer to observer of the mental contents in the final decision is undoubtedly to be found in the fact that tendencies to choose, or final decisions possess the same mental contents as do the motives, and the motives varied with the reagent's past experiences, with the materials used in the experiments, and with their preformed likes and dislikes for certain alternatives. This fact held absolutely in all observers and in all choices. When a preference, or a process of judging constituted a motive for choosing, these same complex activities functioned as the final stage in the actual decision; the desire or fondness for a given alternative, without reference to its opponent, when present to the reagent's consciousness, was a tendency to choose or it was the final decision itself. Another reason for the variability of content in acts of choosing seems to be the fact that the final decision is the outcome of a progressive accumulation of tendencies to choose, or it is a product of responses that seem to reveal a summative tendency, where the tendencies to choose are successive steps in the same persisting motor response. The manner in which this accumulation takes place in different observers, that is, the number and kind of motives which lead to and add to one another vary widely from reagent to reagent.

One form of mental content, however, is invariably present in all acts of choosing, namely, kinaesthesia. These processes are at once the dominating feature and the core of all motives and all tentative or final choices. They may be confined in certain choices—the less vigorous—to the particular regions of the eyes, throat and neck, regions which are involved in vigorous concentration of attention; but in such instances the choices are neither genuine nor vigorous. In genuine acts of choosing, where the act is difficult because of a prolonged conflict of vigorous motives, these kinaesthetic processes are exceedingly complex and intensive, involving the face, throat and neck, shoulders and arms, chest and trunk. They may be classified roughly into three groups for the purpose of convenience only: First, tensions in the throat and vocal organs which may be the bare beginning of vocal innervations, relaxation of facial muscles about the eyes, incipient tendencies to smile and tightening in the jaws; secondly, tensions in the neck or incipient movements of the neck of nodding toward or in the direction of the alternative; kinaesthetic imagery with incipient movement of pointing toward, reaching out toward, or of bending the upper part of the body toward the alternative in question; motor or bodily

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adjustments in the chair as if getting ready to listen to music, or to regard a favorite picture; incipient bodily movements of sitting in a more erect position in the chair; thirdly, a wave of pressure beginning in the chest, perhaps in the region of the heart and extending upward into the throat, terminating in the region of the vocal organs; waves of warmth over the face and through the abdomen; contractions of the diaphragm and external abdominal muscles; tensions in the chest and abdomen, referred to respiratory changes; tendencies to sigh or to open the mouth, together with sharp inhalations or exhalations; tensions from momentary inhibitions of breathing or from slower breathing, where the observer's attention is directed to the change in respiration more than to the chest and abdominal contractions, relaxations and "hollow" or "sinking" sensations from the region of the stomach and diaphragm. In certain observers these kinaesthetic processes take the form of more purely kinaesthetic "sets" or "jerks" or of sudden and general bodily rigidity; in others they are confined more largely to respiratory, organic and emotional reactions; in still others to incipient movements of pointing, nodding, bending, or similar adjustments. To be vigorous or genuine an act of choosing must involve one or more of the above groups of kinaesthetic or organic processes, not necessarily all the items of any one group, but a majority of them. Owing to the variability of the mental contents in choosing, it is not to be wondered at that the contents should not follow any fast and definite rule other than one which can be expressed in general terms. Without a single exception, our observers relied upon the intensity and complexity of the kinaesthetic factors in judging the genuineness or vigor of an act of choosing; in fact, the genuineness or vigor of an act of choosing is directly proportional to the intensity and complexity of the kinaesthetic process involved therein.

In still another respect do we find a great variability in the final periods of the act of choosing, namely, in the observer's method of describing or of interpreting his final decisions. This is due to the fact that different observers assumed different mental attitudes toward their own immediate experiences either immediately after the act of choosing had taken place or even while the process was actually going on. Some reagents turned to the experimenter immediately after the initial outburst of a motor "attitude of acceptance," of an "attitude of friendliness," of a "kinaesthetic adjustment" toward the alternative in question, etc., and announced that they had made their choice. If this motor reaction

which constituted the final decision contained a visual-kinaesthetic schema in which the reagent was conscious of himself in the experimental situation, he called his reaction an "attitude of acceptance"; if his reaction was complicated by the presence of visual or auditory imagery pertaining to placing a record on the machine and hearing it played, he was led to interpret his final decision as an "adjustment" to hear the music; similar conditions determined a like interpretation of his final decisions in series 1 and 2; if neither variation were present he was led to interpret his final decision as a "muscular jerk" or as a "behavior of attention" and the like. On the other hand, certain observers had such verbal processes as "Oh, take this," "Yes, I prefer this one," "This is the one I want," or simply "Take it," "This," etc. Again, in still other instances our observers reported a "consciousness of being in the act of choosing" or a "consciousness of having chosen" etc. The former awareness depended upon a visual-kinaesthetic-organic awareness of the self, schematized into such a complex as "attitude of acceptance"; the latter awareness was purely retrospective and seemed to depend upon the fact that the reagent was called upon, in introspecting, to review his experiences immediately after having them. None of the above mentioned interpretations—the attitude of acceptance or of friendliness, the verbal processes, the consciousness of having chosen—were common to all observers or to all acts of choosing. *A*, *F* and *D*, the verbal choosers, frequently reported such verbal processes as have just been mentioned; *J*, *C* and *B* seldom had such contents in their acts of choosing; *A* was never conscious of himself in the act of choosing or of an attitude of acceptance, but frequently reported a consciousness of having chosen, an awareness which always appeared subsequent to com-bodily relaxation; *B* and *E* were aware of themselves in the complex motor adjustments toward the alternative in question as for example, "visual and kinaesthetic imagery of myself walking down the aisle of an opera house," of "myself pointing to a record on the machine," of "myself leaning back in the chair listening to the selection," etc.; *J* was aware of himself in the act of "accepting" an alternative in terms of a visual-kinaesthetic schema. Such phenomena as these are not invariably present in genuine acts of choosing and constitute peculiar ways in which the reagent labels, interprets or designates the mental contents which are being experienced. They constitute an act of designating, unknowingly, the direction in which the choice is progressing. In other words the

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reagent is interpreting by means of an implicit form of behavior the underlying motor responses which constitute his explicit behavior.*

These variations in the final decision make the final stage of the act of choosing different from earlier and incipient tendencies to choose. For the purposes of convenience these variations can be classified into the "designative period," the "interpretative period" and the "fulfillment period." The final decision, proper, or the fulfillment period, consists of the last vigorous motor reaction to one of the alternatives which terminates the conflict between opposing tendencies to choose. It involves the widespread group of kinaesthetic and organic processes with accompanying visual, auditory, or verbal imagery, which the reagent later interprets as his attitude of acceptance, his adjustment, and the like. The visual, auditory, or verbal contents depend upon the nature of the materials between which the reagent is choosing, but the kinaesthetic and organic contents are relatively similar, (see page 32) involving the regions of the face, neck, upper and lower trunks, shoulders and arms. This period is the essential feature of the final decision. The designative period is largely kinaesthetic in character and may involve such verbal processes as "Take this," "This is the one I want," or it may involve motor imagery of pointing to the alternative in question. This period is not essential to the final decision. The interpretative period consists of the conscious labeling of the immediate mental contents of the act of choosing; it is the point in the act of choosing where the reagent becomes conscious of what he is doing and interprets it; he assumes an interpretative attitude toward his own behavior, either while he is experiencing the immediate contents of choosing or immediately after he has experienced them. This period is likewise unessential to the act of choosing.

If the fulfillment period or the decision proper be compared with earlier tendencies to choose, one finds that the mental contents of this fulfillment period are not different from the mental contents of earlier tendencies to choose except that the kinaesthetic and organic processes may be more intensive and widespread. Neither is there an essential difference in the behavior of attention in the final decision and in the earlier tendencies to choose. These facts point to the conclusion that the final decision is not an act which can be separated, functionally, from its antecedents, but is an act which involves the persistence of its antecedents by being a summa-

*See Watson, Behaviorism, Etc., pages 16 ff.

tive or accumulative product of them. If this interpretation is correct, it would account for the striking similarities between the final decision and earlier tendencies to choose, in the same prolonged act.

The designative and interpretative periods which are usually found in connection with the final decision may occur elsewhere in the act of choosing. In the case of *J* the interpretative process frequently occurred in incipient tendencies to choose. *A*, *C*, and *D* reported designatory verbal or manual-motor processes oftentimes before the final decision had been made. One is obliged to appeal, therefore, to functional criteria in an effort to discover some feature which makes the final decision different from temporary decisions or incipient choices and which will account for the fact that the final decision terminates the choice.

A first functional difference is to be found in the fact that in the final decision a conflict of tendencies to choose has been ended by the reinforcement of one of the antecedent tendencies to choose. This reinforcement may be an original tendency to choose which has persisted in the face of an opposing tendency and has become relatively more complex and intensive until it has overbalanced its opponent. Here the reinforcement is intrinsic and direct and may be due either to the perception of some hitherto unnoticed detail of the alternative or to the gradual increase in the reagent's remembrance of a particular fondness for the alternative in question, without the noting of new details of the alternative itself. Such a reinforcement may be brought about in the act of judging or comparing the merits of the two alternatives, the outcome of which gives added weight to a previous tendency to choose. On the other hand, one tendency to choose becomes a final decision not by means of any such intrinsic reinforcement, but by means of the rejection of the opposing alternative. Here the conflict of opposing tendencies is relieved by the inhibition of one of them, leaving the intensity of the other relatively greater. Again, a final decision may be reinforced by a subsidiary task such as "Hurry," "escape from the conflict," or it may receive added weight, relatively, when the subsidiary task "search for more motives," or "choose for a serious reason" fails to operate. The former subsidiary tasks result in a direct or intrinsic reinforcement while the latter result in an indirect reinforcement by means of the elimination of some persisting tendency which was not very vigorous or well grounded. Those motives are rejected which proved to be superficial and

which delayed the choice, when, by force of numbers, they overbalanced a more serious motive in favor of the other alternative. In such instances where subsidiary tasks cease to function and where one tendency has already begun to dominate over the other, the dominating tendency automatically becomes the final decision. Since motives for choosing are identical with tendencies to choose, the rejection of a motive is the rejection of a tendency to choose; moreover, since motives and tendencies to choose are, in essence, motor reactions to the alternatives, the rejection of a motive means the elimination of motor reactions which serve to delay the final decision by prolonging the conflict. Once this elimination has taken place, the final decision follows. The fulfillment period in any instance, then, is some form of reinforcement of a previous tendency to choose one of the alternatives; this reinforcement may come about in two ways, by an increase in the intrinsic intensity of one of these tendencies or by a diminution in the intensity of the opposing tendency.

In summary, then, the main period of the process of choosing begins with tendencies to choose not one but both alternatives and terminates in a reinforcement of one of these tendencies. Each of these incipient or temporary choices is a motor attitude assumed toward the alternative in question. It is a motor response to the alternative as a whole or some detail thereof. A persisting reinforcement of one of these motor responses constitutes the final decision. This reinforcement invariably necessitates an overbalancing of the conflict. This overbalancing is brought about in an intrinsic or direct reinforcement by the functioning of added musculature or by the more vigorous function of musculature already in operation; in the indirect form of reinforcement the overbalancing is brought about by the elimination of certain of the motor responses. In either instance a reinforcement can be brought about only by the functioning in the final decision of a relatively greater amount of musculature than is operating in the opposing tendency to choose. Several types of reinforcement may be represented in the same act of choosing; the longer the act of choosing is delayed by a conflict, the less vigorous become the opposing motor responses and the less marked is the reinforcement. Introspection number 6 illustrates a direct reinforcement and introspection 9 illustrates an indirect reinforcement.

In order to discover the similarities or dissimilarities in rejecting and in accepting a given alternative, a series of experiments was

performed in which the reagents were instructed to reject one of the alternatives if he could find any good reason for doing so. A large number of very vigorous and genuine rejections were selected and the introspective results compared with the descriptions of positive choices. The behavior of the reagent's attention was identical, invariably, in the two forms of choosing. In positive choices the reagent's attention was directed focally to the alternative in question or to some detail of the alternative (a singer, player, a certain portion of a landscape or painting, etc.) and if the alternative was not present to the reagent's consciousness, as some external object or stimulus, some form of visual, verbal or auditory imagery represented the alternative or some detail thereof. In the latter case our observers invariably reported that it seemed to be the imagery which had been chosen rather than the objective materials. A similar fixation of attention occurred in negative choices, or rejections; in fact the act of choosing was made in quite the same manner as in the positive choices save for the difference in the nature of the verbal processes, the affective toning and the kinaesthetic and organic processes. The reagent's procedure and the functioning of motor responses, (motives, processes of judging, etc.) were the same when considered from a functional point of view. The affective toning and the direction of the motor responses, incipient movements, kinaesthetic imagery and the like were the opposite of the condition in positive choices.

The act of rejecting begins, in the fore-period, with the acceptance of the instructions. The reagent assumes a preparedness to reject—a motor attitude toward the alternatives which are about to be presented. This attitude consists of muscular strains about the face, arms and chest; perhaps of visual imagery of the two alternatives or an eye-motor schematization of their localiation in space behind the aperture, screen or shield; of kinaesthetic imagery with incipient movement of turning aside from the alternatives or of pushing them away, of the vocal-motor imagery: "Reject one," "reject" and the like, together with a high degree of fixation of attention toward the region where the alternatives are to appear. *A*'s preparedness to reject and his preparedness to make a positive choice revealed fewer qualitative differences than in the case of our other observers, these differences being confined largely to verbal expressions and to throat and jaw tensions. *J*'s preparedness to reject contained elaborate series of visual images of the alternatives, of himself in the act of rejecting one of them, of incipient move-

ments and kinaesthetic imagery of curling up his lips, of contractions in the muscles about the face as if in expressions of dislike or scorn. Our other observers reported experiences in the fore-period similar to those of *J*, although frequently not so elaborate and well localized. As this series of experiments progressed the fore-period became less complex in content; the kinaesthetic processes were largely confined to general bodily tensions and to visual-kinaesthetic schematizations representing the act of rejecting, but present to consciousness in greatly syncopated and in very fleeting terms.

The results of this series of experiments agreed with the findings from the first three series, namely, that the fore-period involved incipient stages of those mental processes and motor reactions which were completed, elaborated and intensified in the main-period. The acceptance of the *Aufgabe* is connected, functionally, with the subsequent behavior of the reagent in that the acceptance of the task is an incipient motor response whose intensification, unfolding, delay and final reinforcement constitute its own fulfillment. The directing force of the *Aufgabe*, as far as it can be observed in the present act, seems to lie in the potency with which a motor response, once begun, inhibits its opponents and remains, itself, susceptible to processes of reinforcement.

IV. CHECK EXPERIMENTS

A. *Method, Apparatus and Observers.*—A series of check experiments was arranged for the two-fold purpose of determining what mental processes were essential to the act of choosing and what mental processes were variable and non-essential. The materials consisted of operatic selections as in series 3; seven of the nine observers took part. These check experiments were divided into two series: (1) In the first group the names of two selections of music were presented to the observer, with the following instructions: "I am going to present the titles of two selections of music; you are to choose which of these selections I shall play to you; but if you should care for neither, you may reject both. Take your choice, however, without employing verbal imagery of any sort other than that involved in the initial and subsequent reading of names and of titles and in your acceptance of the *Aufgabe*. If you find that other verbal processes tend to appear in consciousness, immediately endeavor to make your choice in other terms." In the case of certain observers who had great difficulty in fulfilling the instructions it was found necessary to use simpler materials for the choices, such

as the names of two singers, alone. In the second series of check experiments the same materials were used but with the following instructions: "I am going to present the titles of two selections of music; you are to choose which one of these you would like to hear; but if you care for neither, you may reject both. Make your choice, however, without employing vocal-motor or any other kinaesthetic process, either sensory or imaginal, excepting, of course such kinaesthetic processes as are necessary for remembering the names of the two alternatives, for understanding and remembering the instructions, or for merely attending to the alternatives in question. If you find that any other verbal or kinaesthetic processes tend to come into consciousness, begin again and endeavor to reach a decision by means of other processes."

B. *Results of Check Experiments. 1 Typical Introspective Data. Group 1.*

19. Series 4. Music: Rigoletto Quartette, Verdi, sung by Abbott, Homer, Caruso and Scotti; "Oh, For the Wings of a Dove," Mendelssohn, sung by Farrar. *Observer J.* In the fore-period I was aware of vocal-motor-auditory imagery of the instructions: "Do not use vocal-motor imagery in making the choice"; I then imposed upon myself the task of examining each alternative only long enough to perceive the titles, to then hold my tongue tightly against my teeth and to stop in my process of choosing as soon as I became aware of the presence of vocal-motor imagery. Just before perceiving the titles I was conscious of taking a deep breath, of contractions of the muscles about my shoulders and abdomen and of slight tensions in the jaws. These processes were accompanied by pleasantness. I then perceived the "Rigoletto" title, visually, and was immediately aware of an intensive jerking of my head upward and to the right; I then turned to the titles again and perceived "Oh, For the Wings of a Dove" in which perception nearly all of the words stood out simultaneously; the perception was entirely visual; I was again aware of suddenly jerking my head upward and to the right; this I did in an effort to prevent the emergence of vocal-motor imagery. For a short time I was then aware of very intensive strains about the forehead, scalp, chest and shoulders; I fixated my line of regard very rigidly at a point in space directly in front of me and had the vocal-motor: "Visual." (The intensive strains meant to me that the choice was going to be a difficult one; the vocal-motor "visual" constituted a syncopated *Aufgabe* to visualize the titles or any association suggested by the title.) I then had visual imagery of the first bars of the quartette, visual imagery of the title, "Oh, For the Wings of a Dove"; I was then conscious of a sudden "slump" of attention, of almost complete bodily relaxation, but the strains in the throat and about the eyes still persisted. (My eyes were still shut.) I found my regard wandering back and forth from left to right between two vague black "splotches" before me; then the "splotches" faded and became fused in a mass of intense blackness; I then became aware of myself sitting in the chair. This latter awareness was immediately followed by an increase in the intensity and scope of the strains which now spread over the face, shoulders, chest and lower trunk; these tensions were especially great about the forehead and in the throat; I was frowning; my fixation point came in again, localized directly in front of me together with a flashy visual image of the "Rigoletto" title. [The visual schema is a typical means of objectifying the alternatives in such instances where the reagent shuts his eyes or where the alternatives are presented in auditory fashion. The kinaesthetic awareness

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of the reagent in the chair was a task-consciousness and was immediately followed by a sudden heightening of the activity of choosing.] Here a tendency to choose the "Rigoletto" title came in; this consisted of vague strains from tendencies to lean forward in my chair, of slight pleasantness, and of a tendency to fixate very rigidly a point to my left. I was then conscious of the fact that I did not like the "Rigoletto" selection very well; this consisted of incipient tendencies to frown, to close my eyelids more tightly, of kinaesthetic imagery with incipient movements of turning by eyes and head rapidly to the right and away from my fixation point; and of slight unpleasantness. These processes came in very suddenly and upon their appearance the tendency to choose the "Rigoletto" selection quickly vanished. [Here we observe a tendency to reject an alternative, which tendency has suddenly inhibited an antecedent, incipient tendency to choose the same alternative.] Then I had visual imagery of the "Mendelssohn" title; I was conscious of a muscular "set" in the throat as if I were preparing to sing a few notes of the aria, of auditory imagery of portions of the selection and of a mass of kinaesthetic and organic processes which came "rushing into" consciousness, very rapidly increasing to a high degree of intensity. This response consisted of incipient tendencies to lean forward and to the right, to turn my head and eyes suddenly to the right, of a wave of pressure or of movement, beginning in the interior of the chest and traveling upward into the throat, of marked pleasantness, and of sensations of pressure and of warmth from the region of the diaphragm and viscera. I was then suddenly aware of having chosen the "Mendelssohn" title, in terms of a visual image of something darkish to the right and above the visual schema which represented to me the two titles. [In this act of choosing *J's* "attitude of acceptance" did not appear; but he was conscious of "having chosen" after he had made his final decision.]

20. Series 4. Music: Natoma Selections, Victor Herbert, played by the Victor Orchestra; Hensel and Gretel, Prelude, played by Pryor's Band. Alternatives presented in auditory fashion. *Observer A.* [Observer *A* experienced so much trouble in inhibiting verbal imagery that he was obliged to resort to such expedients as chewing gum, whistling, etc.] In the fore-period I was aware of very intense strains over my whole body and of tongue and lip movements involved in whistling a fox-trot in imaginal fashion. . . . On the perception of "Natoma" there was an immediate welling-up of pleasantness and a setting of my mouth to whistle a long, slow note (the first note in the selection) together with strains in the chest from taking a deep breath. (These experiences meant to me an acceptance of the Natoma selection, or a tendency to choose it.) When I perceived the second title I was conscious of a very rapid change in the rate of exhalation and inhalation; breathing came in short, jerky fashion; I was aware also of marked pleasantness, of kinaesthetic imagery of body and arm movements of carrying two small children, one on each shoulder, my arms extending outward to balance them; accompanying this were fleeting auditory images of the tune. I was then aware of total bodily relaxation, of a "flop" of attention, and of continued auditory imagery of the tune of Hensel and Gretel. I turned to the experimenter and announced that I had chosen the "Hensel and Gretel" selection. [Here the choice took the form of a sudden change in breathing, of the kinaesthetic imagery of carrying the two children and of the marked pleasantness.]

2. Typical Data. . . Group 2.

21. Series 4: Music. Farewell to the Bright Vision, La Traviata, sung by Alice Nielsen; Selection from Tristan and Isolde, sung by Sembrich. Visual presentation. *Observer B.* As I perceived the upper title (Traviata) I found my attention lingering on the words, "Farewell to the Bright Vision," whereupon I was immediately conscious of tendencies for my eyes to open a little wider, to take a deep breath, and to set my mouth to utter an ecstatic "Ah!"; then my whole body became rigid and my chest very tense; I perceived the second card and as my attention lingered upon the word "Tristan" I was conscious of familiarity, pleasantness and of a

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tendency to choose this title; this consisted of a more focal perception of the title, of clear auditory imagery of the tune, auditory imagery of repeating the name of the opera, of a sudden strain about the corners of the mouth, and of an immediate but slowly developing tendency to relax. My attention was then centered upon a visual and kinaesthetic awareness of the region of my chest. At this point I became aware in visual terms of the upper title, of more intensive strains in the region of the mouth and eyes—much more intensive than is necessary for mere visual fixation—and of marked tensions in the throat. (These latter experiences constituted a fondness for the “Traviata” selection and also a tendency to choose it.) I was then conscious of the kinaesthetic processes in this latter reaction, which tended to persist; I tried to inhibit them by contracting antagonistic muscles as best I could; I contracted my shoulders and hands; I visualized the contracted muscles in different parts of my body; sagged my mouth; drooped my lower jaw; then intermittent twitchings from different parts of my body claimed my attention. For a long time the kinaesthetic processes constituting my reaction to the “Traviata” title would appear in spite of my efforts; I now became focally aware of the experimenter; this awareness seemed to be the beginning of an *Aufgabe* consciousness; then tensions in the neck, chest, arms, diaphragm and abdomen claimed my attention, repeatedly, group by group; first they would be associated with one of the titles and then with the other as I tended to choose each in turn; visual and auditory imagery having to do with each title came in. As I became aware of the motor reactions my attention would concentrate upon my chest and lungs in visual and kinaesthetic terms as if I were trying to inhibit my breathing by attending to it. I now had visual imagery of the experimenter, seated at the table, paper before him; I had the vocal-motor: “Now let’s get out of this quickly”; no sooner had I said this when a flood of motor processes, together with auditory imagery, all associated with the “Traviata” selection came into consciousness again; I found myself again visualizing groups of muscles which had become tense or which had made incipient movements and I became aware that I had chosen *La Traviata*. (I then reported that my choice had been made in kinaesthetic terms in spite of the instructions to the contrary; I was unable to fulfill the task. Indeed, I had already chosen the “Traviata” selection before I had looked at the second title; upon looking at the second title, I had chosen that as well; each choice seemed to take place simultaneously with the kinaesthetic and motor processes which I have described in the introspection.) [Such experiences as these were typical of observer B throughout the entire series of check experiments. From this and from similar data, it is evident that B found it utterly impossible to make a choice without employing kinaesthetic processes; and it is also evident that tendencies to choose constitute completed acts of choosing when the reagent attempts to arrive at a decision under the instructions to inhibit kinaesthetic processes.]

22. Series 4. Music: *Traumerei*, played by Hollman on the cello; *Tschai-kowski*, Violin Solo, played by Kreisler. Visual presentation. *Observer F*. . . . [After endeavoring for a long time to reach a decision, the observer remarked: “You have eliminated every factor which would enable me to make a choice; I am unable to do anything.] After reading the two titles I had vocal-motor imagery: “Which of these do I want?” For sometime I found myself in a semi-relaxed condition which seemed to be a state of waiting or of expectancy for visual or auditory imagery to appear; then came visual imagery of a violin which was interrupted by the vocal-motor “*Traumerei*”; I then repeated “*Traumerei*” several times in vocal-motor imagery and tried to hum the tune; then the *Aufgabe* came into consciousness in verbal terms: “Try to get the tune in auditory imagery;” my attention then shifted to the region of my right ear; I was then aware of vocal-motor-auditory imagery of humming the tune; I then found myself tending to relax; I had the vocal-motor; “Do not think about the alternatives in vocal-motor fashion;” I had no sooner experienced this imagery when I became aware of the “*Traumerei*” title in visual perceptual terms, of manual-motor imagery of reaching out toward it; this was immediately inhibited by turning suddenly to the other title. (This manual-motor imagery constituted a tendency to choose the “*Traumerei*” selection.)

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Then I read "Song Without Words" and was then aware of manual-motor imagery of reaching out to it as well; I then became relaxed completely and for sometime I was focally aware of the experimental surroundings. Then I had visual imagery of sheet music lying on a piano-rack, of manual-motor imagery of playing on the piano; again I relaxed for again, in this fashion, I found myself tending to choose the "Traumerei" selection; I tried to assume an attitude of going to sleep; I had vocal-motor-auditory imagery, again, of humming the "Traumerei" selection. Then I abandoned the choice. I turned to the experimenter and announced that I had chosen the "Traumerei" title twice, but could not make any progress without kinaesthetic processes.

23. Series 4. Music: Gadski and Boritz; auditory presentation. *Observer A.* As I perceived the stimuli I had vocal-motor-auditory imagery of repeating their names, then the vocal-motor: "Man-woman," with vague sensations of eye-movements from left to right. Then I was aware of the verbal process: "Oh, shucks! Had things he not" (meaning that I had had verbal processes which the experimenter had instructed me to inhibit.) Then I repeated the names, Gadski and Boritz, several times in rapid succession; suddenly there was a rapid shift of my line of regard from left to right, a very vigorous vocal-motor image, "Gadski," marked pleasantness, and an immediate relaxation of bodily strains. I then was aware that I had chosen "Gadski." The choice consisted of the vigorous vocal-motor image and of the sudden fixation of a point to the right which point meant to me the alternative, Gadski; and the pleasantness. The pleasantness and the sudden turn also meant to me that I was very fond of Gadski. My fondness for her apparently overbalanced my fondness for Boritz, although I like both singers immensely.) [The reagent had been instructed, previously, to use verbal imagery only in the repetitions of the names of the singers; from this and other introspections of a similar nature from this observer, it is clear that he was totally unable to choose without employing kinaesthetic processes.]

24. Series 4. Music; Caruso and Tetrizzini. *Observer E.* Auditory presentation. As I perceived the word "Caruso" I was aware of visual imagery of his face, of a kinaesthetic relaxation over my entire body, of "tingling" sensations in my throat and for what seemed several seconds my attention was focally claimed by these processes. I then completely relaxed. I became aware of the experimental surroundings and for the moment wholly unaware of the two alternatives. (This sudden kinaesthesia and visual imagery of Caruso constituted what seemed to be a completed choice of the "Caruso" alternative.) Then I perceived the name "Tetrizzini"; I had auditory imagery of her voice together with the same sort of kinaesthetic "jerk" as before, only more tense; it consisted of incipient contractions of my arms, of my chest muscles and abdomen, intensive tensions in the throat and organic sensations from the region of the diaphragm. My body then relaxed again; my attention shifted once more to the experimental surroundings. Now I was aware that I had chosen the "Tetrizzini" alternative. I then laughed at my being unable to fulfill the instructions. Then I was again aware of visual imagery of Caruso, of auditory imagery of his voice, of increasing pleasantness, of increasing tensions in the throat, chest and neck; once more I relaxed and attention momentarily left the problem. Then came a series of visual images of Tetrizzini with very rich and clear auditory imagery of her voice, accompanied by a rapidly rising pleasantness and by "tingling" kinaesthetic experiences localized widely over the body, by tensions in the throat and by contractions of the diaphragm. I completely relaxed, but only momentarily, for this same complex reaction rushed in upon me again accompanied by persistent imagery of Tetrizzini's voice; at this juncture, I had the vocal-motor process: "Well, Caruso is a great singer," along with visual imagery of him as he appear on the stage in a favorite role and a marked bodily reaction much the same as before. Breaking into this consciousness was an awareness of auditory and visual imagery of Tetrizzini with the accompanying organic and kinaesthetic reaction. Here I gave up trying to progress farther without kinaesthetic processes; I found that I had already made several choices and that I was wholly unable to fulfill the instructions.

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25. Series 4. Music: Barcarolle, Tales of Hoffmann, Offenbach, sung by Farrar and Scotti; Selections from Natoma, Victor Herbert, played by the Victor Orchestra. *Observer J.* I first perceived the title, Natoma, and I was immediately aware of strains about the eyes, concomitant with a visual fixation of the title; then I was aware of a diffused muscular tenseness localized in the throat, shoulders, neck and about the face, of faint auditory imagery of portions of "Natoma" and of intensive pleasantness. My attention then immediately abandoned the title; I was aware of a sudden and complete bodily relaxation and of having made my choice. This latter awareness consisted of a lingering visual image of the "Natoma" card, of lingering kinaesthetic sensations from my bodily relaxation, of a heightened consciousness of the experimental surroundings, of a sudden and focal perception of the second title, with exceedingly rapid and syncopated verbal imagery: "Well, I have already chosen." Then I read the name of the second selection. This was quickly followed by visual imagery of an operatic scene in which I saw flashes of stage settings, of singers standing about, dressed in gay costumes; this was accompanied by intensive strains in the throat and by faint auditory imagery of my own voice, saying: "These are opera singers" (referring to Farrar and Scotti). I had auditory imagery of two voices, the one high and other low and my attention was absorbed momentarily in the pleasant intervals and blending of their tones. These latter processes were accompanied by incipient tendencies to smile, by marked pleasantness, by vague strains in the chest and abdomen, by intensive strains in the throat, and by a diffuse rigidity of my whole body, especially about the abdomen. My attention again abandoned the titles; I was conscious of complete bodily relaxation and of the fact that I had chosen the second title. Then for some time I continued to examine first one title and then the other; but upon each examination I was conscious of an onrush of incipient motor tendencies which, each time, seemed to constitute a complete choice. I was wholly unable to prevent kinaesthetic processes from appearing in consciousness or from seeming to constitute my choice; for a long time I endeavored to visualize numerous associations with each title but even then I was unable to inhibit the motor reactions, and at the same time to arrive at a decision. For long periods of time my mind would be a blank other than an awareness of the experimental surroundings or of general bodily strain. I could not progress without motor processes. I then gave up my endeavor and my attention shifted to the act of introspecting. [Here it is clearly evident that *J* could not choose without kinaesthetic processes and that under the instructions each tendency to choose now immediately completed itself as a final decision.]

A further variation of our method was introduced in order to ascertain if it were possible to choose without kinaesthetic processes when other materials were used. Certain of our observers were presented with alternatives of other sorts between which to make their choices—moral principles, universities at which they would accept a teaching position, and the like. The following introspection illustrates the nature of our results in this experiment:

26. Series 4. Names of two universities: Nebraska and Indiana. *Observer C.* [After several second the reagent remarked: "I cannot choose under the instructions; I have made several decisions and all of them consisted of kinaesthetic processes."] As I perceived the name, "Nebraska," I had a series of very richly detailed visual images of the campus at the University, with large crowds of students walking from one building to another; the buildings were large and impressive. Then I had visual images of the campus at Indiana; the buildings were smaller and smaller groups of students were walking about the buildings. Then I had visual imagery of the Psychological Laboratory at the University of Indiana, and I saw, one by one, various men who have taught psychology there; these latter processes were accompanied by

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sensations from inhibited breathing and from tensions about the brows, arms and shoulders. I then turned my regard suddenly to the left (as if to inhibit the kinaesthetic processes by turning to the other alternative) and again had visual imagery of the University of Nebraska stretched out before me. Then I brought both universities into a visual-kinaesthetic schema with Indiana at my right and Nebraska at my left; for a time my attention was concentrated on the left; I visualized the laboratory at Nebraska; it was large; there was an instructor leaning against an experimenting table; then I saw the large buildings, campus, and crowds of students walking to and fro; I then saw myself in the laboratory; I was conscious of a feeling of ease, expressed in general bodily relaxation, in incipient tendencies to smile, and to take a deep breath. These processes were suddenly broken into by an awareness of the *Aufgabe* in terms of a visual image of the experimenter, whereupon these sensations from bodily relaxation and tendencies to smile gave way to a general bodily rigidity and tenseness with tendencies to frown; I was again conscious of the visual kinaesthetic schema; I sat up more erect in my chair; then I seemed to be standing midway between the two universities as the schema extended out wider from left to right; I had kinaesthetic imagery of walking in the direction of Nebraska to the left; I had incipient tendencies to incline my head toward the left and forward; but again I became aware of the experimenter in visual imagery, which meant to me a consciousness of the task; I was again aware of motor imagery of walking toward Nebraska and of more visual imagery of the experimenter; then there quickly followed manual-motor imagery with incipient movements of pushing aside the schema to my right, which meant to me a rejection of the "Indiana" alternative. All this time I was trying to express my choice in other than kinaesthetic terms; several times I was choosing the "Nebraska" alternative, but found that each choice was kinaesthetic in character as well; then I resorted to nodding my head toward the "Nebraska" schema, but recognized that this was motor, also; then I said to myself in vocal-motor terms: "I cannot prevent kinaesthetic processes from coming in; I have already chosen the "Nebraska" alternative two or three times and I have rejected the "Indiana" alternative once, but each acceptance or rejection has consisted of motor processes." Then came more visual imagery of the Nebraska situation; a general feeling of bodily excitement, expressed in heightened circulation, in strains about the face and neck, in organic sensations about the diaphragm, and in the vocal-motor: "Well, I am choosing the "Nebraska" alternative again." Then there came the vocal-motor: "All right, I will get it this time!"; kinaesthetic imagery of taking a long, deep breath, incipient tendencies to pull my shoulders together and to sit more erect in my chair. (This constituted a resolve to do my best to fulfill the instructions and to try again harder than ever.) The visual schema appeared again; Nebraska was on the left and Indiana on the right; I immediately found myself experiencing kinaesthetic imagery and incipient movements of extending my arm in the direction of the "Nebraska" schema to the left; there were also incipient shoulder movements; once more my attention shifted abruptly to the experimenter and to the *Aufgabe*; I had the vocal-motor: "I can't do it," together with very intensive strains about the face, in the throat, chest, arms and shoulders. The verbal processes meant to me that I was unable to fulfill the instructions.

This series of experiments was extended over a period of several weeks, with two observers, to find if they could choose without kinaesthetic processes after a prolonged period of training, but at the end of this series, neither observer was able to make his choice without employing kinaesthetic processes.

3. Summary of the foregoing introspective data. Our observers were unable, save in a few instances to reach a difficult decision without employing verbal imagery. *J* and *C* proved to be excep-

tions to this rule. All observers were able to make easy choices without employing verbal processes, providing the materials used as alternatives were familiar. In not a single instance was any observer able to make any form of choice without employing some form of kinaesthetic process.

Observer *A*, to whom the alternatives were presented in auditory fashion, habitually schematized the alternatives by fixating a point to the left and another to the right and his final decisions consisted of sudden motor fixations either to the right or to the left, of changes in rate of breathing, of general bodily tensions followed by an abrupt relaxation. If both tendencies to choose were equally intensive, he found it necessary to employ verbal processes to complete the choice. By means of these verbal processes he was able to characterize the alternatives and to make finer discriminations in his responses to them. As the immediate antecedents of his quick adjustments to the right or to the left, these verbal images seemed to function as stimuli for the reinforcement of one of the conflicting tendencies.

Observer *B* had less difficulty in inhibiting verbal processes than did *A*, using visual imagery where *A* found it necessary to use the verbal. *B* always found himself choosing one of the alternatives immediately after perceiving it and he made this choice as well as his final decisions in terms of kinaesthetic processes which he was totally unable to inhibit. Any attempt to continue in the act of choosing after he had found that he had already reacted to one of the alternatives resulted in a repetition of that reaction. *C* could make difficult choices without verbal imagery, but found that other forms of kinaesthetic processes were essential; the latter consisted of incipient muscular movements about the head, in the arms, throat, and about the chest, accompanied frequently by incipient movements of pointing to the alternative or a visual-kinaesthetic schematization of it and by kinaesthetic imagery of moving or walking toward the schematized alternative. *E* likewise found that such a motor reaction, appearing immediately after the perception of an alternative constituted a completed choice. He tried again and again to employ other means of arriving at a decision but he invariably failed.

J had little difficulty in inhibiting verbal imagery, but in no instance was he able to choose without some form of bodily kinaesthesia. After repeated attempts to fulfill the instructions he found that the motor reactions which constituted his choosing might con-

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sist of nothing more than a sudden constricture in the throat, of vague and diffuse tensions in the chest, about the face, and of incipient muscular movements about the mouth and eyes. This form of motor response was extremely constant and tenacious; its only variations, after weeks of training, were toward greater complexity and intensity. After long experimental sittings which sometimes included twenty-five choices in number, this form of motor response followed immediately after the perception of either alternative with surprising constancy and regularity. He reported, in agreement with our other observers, that any motor reaction which normally constituted but an incipient tendency to choose, now became a full-fledged choice. *D*'s acts of choosing under the conditions of these check experiments showed practically no difference from his normal choices; verbal and other kinaesthetic processes invariably constituted the content of his choices in spite of the instructions. *E*, like *B*, found that the instructions to inhibit kinaesthetic processes had the result of turning his attention to any vague and diffuse kinaesthetic background which normally never reached the focus of consciousness. *E*, too, found that the emergence of kinaesthetic processes was the invariable antecedent of a tendency to relax and of a consciousness that he had already chosen the alternative in question. *F* reported this latter experience, also, and in her case, when such a tendency had once occurred it persistently tended to recur; her kinaesthetic tendencies eventually dropped out, however, leaving visual and auditory imagery which gave to her consciousness a day-dream-like aspect. As long as visual and auditory images persisted, with no bodily kinaesthetic accompaniments, she was unable to proceed with the act of choosing.

In summary, the check experiments revealed that:

1. No observer was able to inhibit kinaesthetic processes and at the same time to choose between two alternatives.
2. No observer was able at any time to make a voluntary choice without employing some form of motor attitude toward the alternative in question. It was this motor attitude or response that invariably constituted the act of choosing.
3. After long periods of training, no observer was able to find a substitute for the kinaesthetic processes which formed the core of his choosing.
4. The degree of genuineness and of vigor of each tendency to choose a specific alternative, and the genuineness or vigor of each final decision was proportional to and dependent upon the intens-

ity and complexity of the kinaesthetic and organic processes involved therein. In other words, the genuineness and vigor of an act of choosing depends upon the intensity and complexity of the motor responses which form their core.

5. Under the instructions to use other than kinaesthetic processes, all reagents discovered that such motor responses or attitudes as constituted tentative choices under normal instructions, now constituted complete acts of choosing. The emergence of the first motor attitude terminated the choice. Upon repeated attempts to continue, each subsequent motor attitude constituted, in turn, a separate and complete choice.

6. If kinaesthetic processes be eliminated from the acceptance of the *Aufgabe*, the instructions will not function; the act of choosing cannot progress.

7. Verbal imagery is not essential to an act of choosing but its importance varies greatly from individual to individual. In prolonged choices, where finer responses are necessary to overbalance a conflict, verbal processes are necessary for certain observers, particularly those who lack visual imagery.

8. Kinaesthetic processes, as such, are the invariable components of an act of choosing, while visual, auditory or other such concrete and non-kinaesthetic processes are the variable components.

9. Where objective stimuli are eliminated from the materials used in the act of choosing, by presenting the alternatives in auditory fashion, the reagent finds it necessary to schematize the alternatives in visual or in kinaesthetic terms or both. This is done either by fixating a point to the left and to the right or up and down. Under these conditions the choice is made in the same fashion as if the alternatives were objectively present. The motor responses are made toward or in the presence of the visual-kinaesthetic schema. This is also true when the reagent eliminates the objective alternatives from consciousness by closing his eyes.

10. The materials for the alternatives, their mode of presentation, and the instructions can be modified in the most diverse fashion, but if a choice follows, it always takes the form of a motor attitude or response.

V. SUMMARY AND INTERPRETATIVE CONCLUSIONS

The act of choosing cannot progress in any of its stages without kinaesthetic processes of some sort as mental contents, or without

the emergence of some form of motor attitude or response as a form of overt behavior.

Kinaesthetic processes or motor responses are essential to an act of choosing under all of the following conditions: (1) that the choice be easy or difficult; (2) that the reagent either rejects or accepts a given alternative; (3) that the reagent chooses slowly or hurriedly; (4) that the act of choosing becomes greatly simplified or automatic after frequent sittings; (5) that the reagent makes prolonged and repeated attempts to choose other than in motor terms; (6) that associations represented in consciousness by visual, auditory, or other concrete imagery persist over periods of several seconds; (7) that the objective materials between which the reagent chooses be eliminated by presenting the alternatives in auditory fashion.

Kinaesthetic processes are the only mental contents in the act of choosing which will differentiate between easy and difficult choices, between positive and negative choices and between genuine and non-genuine choices.

Both structurally and functionally the motive or reason for choosing a given alternative is identical with a tendency to choose or with the final decision.

The function of concrete visual, auditory or other imagery in the act of choosing, and oftentimes of verbal imagery, seems to be the same as the perception of the objective stimulus or of some detail of it, namely, the representation in consciousness of the stimulus to which the reagent is making his motor response or is assuming his motor attitude. This imagery, when functioning in place of the objective stimulus, is the "object" to which the reagent is conscious of reacting. Examples of such concrete imagery are: Visual images of operatic scenes, of a painting hanging in one's room, of a certain singer, of an orchestra playing, etc.; auditory images of portions of a musical selection, of a singer's voice, of a record being played on the machine, etc.; verbal imagery characterizing the alternative, such as, "This is beautiful," "Mozart more classical," "duet," etc.; verbal and concrete imagery involved in judging and comparing, where the imagery represents the objects compared.

The motor response which constitutes either a tendency to choose or the final decision varies as to minute details from choice to choice and from observer to observer and it varies likewise with the genuineness of the choice. Visual imagery may be entirely absent; verbal imagery or auditory imagery may also be entirely

absent. In the less genuine and automatic choices the kinaesthetic processes are confined to the region of the eyes, mouth and throat. There may be no representation of the stimulus other than the auditory or visual perception. In the genuine and vigorous acts of choosing are involved the muscles about the eyes, mouth, throat, chest, shoulders, arms and abdomen. Kinaesthetic processes here are variously distributed as follows: In the region of the mouth, due to incipient tendencies to smile; in the region of the eyes due to incipient contractions or relaxations; imagery with incipient movements of sitting in a more erect position in the chair, of leaning forward toward the alternative or schematized alternative; sensations from momentary changes in rate of breathing or from momentary inhibitions of breathing; imagery and sensations from incipient movements of pointing toward an alternative; sensations from muscular changes in the region of the diaphragm or external abdominal wall (the latter possibly connected with respiratory changes); sensations from incipient tendencies to open the mouth or to utter exclamations of fondness and delight; kinaesthetic-tactual experiences which can best be described as "waves" of pressure beginning in the chest near the heart and traveling upward into the interior of the throat; kinaesthetic-tactual experiences of "warmth" spreading over the face or through the viscera. These reactions are interpreted by the reagent in numerous ways, as an "attitude of acceptance," "feeling of friendliness," "muscular jerk," "motor attitude," "motor adjustment," "adjustment to hear the music," "bodily set," kinaesthetic set" and the like. These interpretations depend, to some extent, upon the behavior of the reagent's attention while in the act of choosing—to the number of elements which happen to be woven at the time into visual-kinaesthetic schemata; and they also depend upon the presence, in the complex, of an awareness of the experimental surroundings, of the reagent himself, (screen, aperture, etc.) of the phonograph, and the like. These interpretations also depend, probably, upon the habits of the reagent in using the different terms.

In certain observers the musculature involved in the act of choosing was almost always confined to the face, throat, and chest; in others it was more widely distributed and involved the shoulders, arms and abdomen. In general the responses revealed a definite direction. In positive choices this direction was either of bringing the alternative closer to the reagent or of movement toward the alternative; in negative choices the direction was that of moving

away the alternative or of moving away from it. In practically all instances, however, the greater direction was to be found in kinaesthetic imagery while actual movements were only exceedingly slight or very incipient. In the less genuine and the more automatic choices hardly any direction was reported; here the muscular action was confined largely to strains and tensions.

The motor response which constituted either a tendency to reject an alternative or a final rejection involved, at different times and in different observers, the following factors: Sudden tendencies to turn away from the alternative (objective or schematized); incipient tendencies to push aside the alternative (objective or schematized); incipient tendencies to frown, to assume a disgusted or scornful facial expression; strains about the jaws and in the throat; tensions in the chest and abdomen, and respiratory changes.

The *Aufgabe* in the act of choosing may assume various forms; it may be explicit as a verbal awareness of the instructions or some part thereof, or it may be implicit as an imaginal or perceptual awareness of the experimental surroundings, of the flight of time, or of the reagent himself.

In a voluntary choice there is no consciousness of activity as such, no awareness of an immediate and unanalyzable "self" and no conscious conative or striving process. Nowhere in the literature has the writer been able to find such detailed and carefully given introspections of the act of choosing as were obtained from our observers. Each reagent was familiar with the descriptions of these various contents which have been attributed, in the literature, to the volitional consciousness. (Ach, 1; Michotte, 6; Calkins, 4.) All agreed that in their most genuine and difficult acts of choosing such experiences as might be termed "feelings of mental activity," "immediate consciousness of the self," "elemental awareness of the self," "consciousness of willing," etc., could be analyzed into organic and kinaesthetic processes, with occasional visual, auditory, or verbal accompaniments. The writer believes that reports of such elemental contents are due either to incomplete analyses, to the biasing influence of an interpretative attitude, to an "idea in mind" whether conscious or unconscious, or to the confusion between introspection and retrospection—between description of immediate content and interpretations of immediate content. While the immediate content of the act of choosing is still lingering in consciousness certain observers found themselves in the process of labeling or evaluating their immediate experiences; these processes

were only occasional elaborations of the fundamental contents into interpretative attitudes, where the reagent regarded a mass of imagery and sensory experiences as meaning to him a certain complex product. Conscious of the self, of mental activity, and the like are on a par with "attitudes of acceptance," "feelings of exhilarations," and "feelings of excitement;" they are merely interpretative names for certain groups of elementary sensory and imaginal experiences.

A description of the sequence of these mental processes, in the act of choosing, will not reveal its determining characteristics for the reason that as far as their quality and number are concerned they are variable from reagent to reagent and from choice to choice. Moreover, shiftings in the clearness relations of these mental processes or changes in the reagent's behavior of attention are variable in a like manner. There is no evidence in the nature of the mental processes themselves or in their sequences, as such, that any directing influence or determining tendency can be traced to the mental processes themselves.

In the same fashion as mental processes have no significance in the act of choosing when divorced from the underlying motor responses, so the determining tendency of the *Aufgabe* likewise possesses no significance when regarded apart from its relation with motor responses. The dependence of one period, in the act of choosing, upon another period, or the dependence of one process upon another cannot be traced to the mental processes or associations between mental processes but to the motor responses involved in those respective periods.

The sequence of motor responses in an act of choosing is the same for all observers and for all choices of like nature; they are the functional characteristics which are identical under all conditions of choosing whereas the mental processes and associations as such are not identical under similar conditions. It would seem, therefore, that the sequence of activities, in choosing, can be described in terms of a succession of motor responses and that to trace the functioning of a determining tendency means to trace the manner in which one motor response depends upon another.

The sequence of these motor responses reveals that the reagent's behavior is directed toward a certain goal and that that goal is a completed motor response. The determining tendency here might be explained in terms of co-ordinated and patterned reflexes, the forces of which are those of integration, disintegration, reinforce-

ment, irradiation, summation and the like. This motor response begins in the same fashion in all observers; the stages through which it must pass before it is completed are the same in all observers and in all choices of a like type; if these motor responses are eliminated or prevented from completing themselves, the act of choosing is halted; the motor responses are completed in the same fashion in all reagents; it would seem, therefore, that the criterion of an act of choosing is to be found in the unique stages through which the reagent's behavior, consisting of complex motor responses, must pass before it is completed.

Further evidence in favor of this interpretation may be found in the fact that if the initial preparation for the act of choosing, in the fore-period, be vigorous, i. e., if the motor adjustment be an intensive one, the subsequent responses which the reagent makes to the alternatives are more intensive and vigorous; if the initial preparation is a mild or weak one the subsequent responses are similarly weak unless the predisposition to respond vigorously to a favorite alternative is great enough to add vigor to the act of choosing. Still other considerations point to the same interpretation. A conflict implies an opposition of forces and the functioning of certain media which affect one another. No medium is observable in mental activity, as such; there is no consciousness or feeling of conflict other than the awareness of muscular tension. There is an observable medium, however, in the motor responses between which take place, reinforcement, delay and summation.

First, there appears the bodily "set" or "preparedness" for the act of choosing which at once constitutes the acceptance of the *Aufgabe* and consists of a complex motor response both to the hearing of the instructions and to the experimental situation (aperture, alternatives). The essential features of this initial response are its general or undefinitized character and its anticipatory character. These features are essential in that they give to the subsequent motor responses a peculiar dependence upon the initial response, namely, unbroken continuity. The relation of the latter to the former lies in the condition, first, that the same musculature is involved but now with movements more sharply defined and more intense; secondly, in the condition that at the outset a response existed which could persist and become elaborated in the presence of additional stimuli. The anticipatory character is derived from the condition that the initial "set" or "preparedness" is a prototype, so to speak, of what is to follow, containing incipient reactions

which later are renewed but in more definitized form. In other words, the subsequent responses are a continuation of the same adjustment which begins with the acceptance of the instructions; the subsequent responses must have a foundation or structure upon which to function and this structure must not give way but must persist and it must retain a unified character. The whole adjustment finds its unity in a common core of muscular movement or incipient tensions. Descriptive clues to this interpretation may be found in the reagent's incipient tendencies to execute in advance the act of choosing by fixating the aperture, by making incipient movements of turning from one alternative to another, by assuming incipient motor attitudes toward the alternatives which are to be presented, and the like.

The second stage in the act of choosing consists of the perception of one of the alternatives with an immediate tendency to choose it, followed by a perception of the second alternative and a similar tendency to choose it.* These tentative choices are motor responses either to some detail of the alternative objectively perceived, to the alternative as a whole, or to stimuli represented in consciousness by visual, auditory, or some other form of imaginal process. In this way the content of past experiences with the alternative in question apparently functions as the stimulus. The motor response which began in the fore-period suddenly undergoes a marked change; it becomes definitized, more widespread and intensive, sharply localized and focussed in the direction of a specific stimulus. Its definitization has consisted in the circumstance that it had been divided into two tendencies to respond to two alternatives; its greater intensity and complexity have been derived from the functioning of a greater amount of musculature or from the more vigorous functioning of the same musculature or both. There is always, however, a continued functioning of the same musculature as in the acceptance of the instructions. The greater complexity was derived in most instances from changes in respiration, circulation, from internal muscular changes about the stomach and abdomen, and from added tensions in the throat or about the face. This definitization and splitting up of the initial response of the fore-period constitutes the first stage through which the initial response to the instructions

*Type of choices are possible, of course, where tendencies to choose an alternative immediately after perceiving it do not take place. Where the act of choosing is thus delayed without the appearance of such incipient tendencies it ceases to become genuine for the reason that vigorous conflicts do not develop. It becomes genuine when incipient tendencies do appear and produce a conflict.

must pass before it is completed. It has owed its origin to the presence of two stimuli located in such fashion that the reagent must respond to each stimulus separately.

Thirdly, there appears a period of conflict between these two definitized responses, the descriptive features of which are the vacillations of the reagent's attention from one alternative to the other and the successive focussings of the initial response first to one alternative and then to the other. Unpleasantness and widespread bodily tensions develop as a direct result of this conflict. The tensions may be traced to the blocking of the response to one alternative by the tendency for the opposing response to emerge. The conflict owes its origin to the presence of stimuli which demand separate responses and to the fact that the same or antagonistic musculature is involved in the two responses. The reagent must turn from one alternative to the other and he finds it impossible to adjust himself to both stimuli at once under the instructions to adjust himself to only one, and still choose only one alternative. Each stimulus controls, separately, each response, and the same musculature which is involved in each response functions independently in each response. This situation holds under any form of presenting the alternatives. If they are presented in auditory fashion the reagent schematizes or objectifies them and without doing so he cannot choose. The essential functional features of this period are, first, that one motor response inhibits the completion of its opponent; secondly, that the conflict results in a delay in the completion of both responses; thirdly, that during the conflict both responses persist. One motor response delays its opponent under the condition either that the same or that antagonistic musculature is functioning. The process of definitization of the initial response to the instructions has now been halted, temporarily. During this delay the conflicting responses may diminish in their intensity; the reagent tends to relax; the whole process is now being left in its general and relatively undefinitized form as it was at the outset; but the act continues for the reason that the reagent is still responding to the instructions. At this juncture, however, the reagent may elaborate the instructions and accept these elaborations, thus preparing himself for a more elaborate behavior than was possible at the outset; he does this in the same fashion as he accepted the original instructions; he imposes upon himself some form of subsidiary task, "hurry," "search for more motives," "find associations," and the like.

Fourthly, one of the tendencies to choose becomes reinforced; it is re-focussed upon a certain alternative, with additional intensity. The added intensity is derived first, either from the functioning of more musculature, or by the more vigorous functioning of the same musculature as was involved in previous tendencies to choose that same alternative; the stimulus may be a new detail of the alternative not noticed before or the appearance in consciousness of a fresh association or memory in connection with the alternative. Secondly, added intensity may be obtained from the functioning of a subsidiary task, to hurry, or to search more closely. The response which is affected by this reinforcement is the one which might have been a little stronger in the conflict or the one which happened to be claiming the reagent's attention at the time the subsidiary task was accepted. Any subsidiary task, to be able to function in this way, must be one the acceptance of which involves the same musculature as was already in operation; it must be one which will re-stimulate the initial response into renewed and more vigorous activity. Under these conditions the subsidiary task seems to function as an additional stimulus which produces a summative effect on the acceptance of the instructions; the effect must be that of a contribution to the response which had already begun. It makes additional responses possible which can be added to the process of definitization of the whole act. No subsidiary task which cannot fulfill these requirements has a functional value in the act of choosing. Thirdly, one of the opposing tendencies to choose may become relatively more intense by the rejection of one of the alternatives. This rejection permanently inhibits the persisting tendency to choose the alternative which is rejected and results in giving to the remaining tendency to choose a greater amount of vigor and intensity, relatively, than its opponent. Any form of reinforcement involves the essential features of overbalancing the conflict and of giving to one opposing tendency to choose a condition of relatively greater intensity. As soon as the reinforcement takes place the choice is at an end. One of the responses which had commenced with the acceptance of the *Aufgabe* has now passed through the processes of definitization, of delay and of a final reinforcement. The reinforcement has eliminated one of the two courses of definitization offered by the objective situation that there were two alternatives.

The process of reinforcement seems to depend upon activities not unlike summation and irradiation.* This may be observed: (1) In the gradual increase in the intensity and complexity of a tendency

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to choose when the stimuli are multiplied either by arousal of associations or by the perception of some new detail of the alternative. The same musculature, when restimulated by a new stimulus, responds with renewed and increased vigor. (2) Each subsidiary task (choose for a friend, hurry, do I really want to hear this, search for motives, etc.) has the effect of reiterating the stimulus, "choose." (3) The act of judging or comparing the different alternatives involves a motor background in common with the musculature which is involved in the act of choosing. In responding to the new situation of judging rather than of choosing, the motor response is being re-stimulated and the resulting responses add their quota to the developing tendency to choose.

The *Aufgabe* and its fulfillment, in choosing, then, are different stages in the same prolonged adjustment or motor response. The unity of the entire act is found in the functioning of musculature and of motor responses which are common to the entire act. In certain individuals these responses are confined more largely to the face, eyes, throat, neck and chest; in others they involve the shoulders and arms as well. When the response to the "choice situation" has been completed, i. e., when motor relaxation sets in and the reagent turns his attention to other stimuli than are associated with the act of choosing, the structure of the act of choosing has been eliminated. The choice is at an end. Complete relaxation of any of the motor responses in the act of choosing is a signal to the reagent that the choice has been made. If it comes prematurely, the choice is premature; if it is prolonged or delayed, so is the choice. The conditions which prevent a premature choice or which prolong it are the subsidiary tasks. The act of choosing seems to be a greatly complicated patterned response. The acceptance of the original instructions gives to this response its general structure or pattern. The acceptance of subsidiary tasks elaborates and complicates this pattern, making it possible for renewed responses to reinforce the act and to prolong it, making it possible, also, for additional reactions to supplement those which have already begun. Any consciousness of acceptance, consciousness of effort, of determination, searching, and the like, are merely interpretations of changes in the accepted task. If the reagent finds that he has entirely relaxed before a decision has been reached he must re-accept the original instructions and respond once more to the general situation of choosing before

*Sherrington, *The Integrative Action of the Nervous System*.

his subsequent responses can again become definitized. Striking examples of this may be found in the data from our check experiments.

The reagent is often very quick to recognize the persistence or the reinforcement of one of these conflicting tendencies to choose. Directly, he recognizes the reinforcement in such verbal processes as: "I want this," "Well, I am on the point of taking this one," "I have chosen this one" and the like, or his recognition may take the form of an "attitude of acceptance." Indirectly, he recognizes the reinforcement by such verbal processes as "Take it," "This better," etc. The reagent's behavior, in choosing, may be said to fall into two kinds: First, there are his explicit responses to the alternatives and to the general and subsidiary tasks; secondly, there is a more implicit form of behavior which involves the processes of recognition and interpretation just mentioned and this latter behavior constitutes a labeling or interpreting of the explicit behavior. It is in the explicit behavior that we find the functional clue to the act of choosing.

An act of choosing, then, is a delayed and reinforced motor response to grouped stimuli. The stages through which this response must pass before it is complete give to an act of choosing its distinguishing characteristics. These stages are of definitization, delay and reinforcement. The definitization takes place in dual fashion; the delay is due to a conflict in the dual process of definitization. The reinforcement involves summation and irradiation of responses and the elimination of one of the tendencies toward definitization.

The so-called determining tendency of the *Aufgabe*, as a directing force, consists undoubtedly of the energy of motor responses and of reflex patterns. It is traced by analyzing the dependence of one motor response upon another and by finding the method which guarantees this dependence. It would seem that where an *Aufgabe* is consciously accepted and the end of the act is anticipated, the directing force of the goal-idea may be traced to the motor responses of accepting the goal-idea and to the stages through which those motor responses pass before the particular act in question is completed. The progress of the act follows some trend of definitization, focalization and accumulation and depends upon the functioning of additional stimuli as well as upon the initial acceptance. The *Aufgabe* must be an incipient motor response which will act as a nucleus or foundation on which the fulfillment of the *Aufgabe* can be

hinged when subsequent stimuli evoke accumulating and definitizing responses. The determining tendency, structurally, becomes the initial response of a unified series and also the medium which gives unity to the series. First, it is an incipient motor adjustment; secondly, it is the persistence of this motor adjustment. Anticipation of an end means an incipient motor response which persists and unfolds; the beginning and the end having the elements in common of common motor adjustments. The features which the consciousness of accepting the task has in common with the consciousness of fulfilling the task give to the initial consciousness its anticipatory character.

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